An Exploration of The Factors Affecting the Impact of Overtime on Personal and Job-related Outcomes in the Chinese IT Industry

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Abstract

Background: Overtime has become a widespread phenomenon in the current information age that creates high speed working pace and fierce competition in the high technology global economy. The influences of overtime in the workplace on employees' health (physical health and mental health) and life have been widely studied. However, the possible factors that may moderate the adverse impacts of overtime on employees have been less widely investigated and the preceding findings are not always consistent. Although research does indicate that rewards and worktime control (WTC) may reduce the negative influences of overtime on employees, there is also a paucity of research studying specific effects of their sub-dimensions on employees' mental health and life. A greater understanding of these effects on overtime workers is important for the development of future, more effective interventions to prevent or reduce overtime's negative influences.

Aims: The purpose of this research is to explore the predominant influences of overtime on employees' mental health and life and further investigate the potential effects of rewards and WTC on these influences.

Method: A sequential mixed method is used in this study, semi-structured interviews (N = 13) followed by online questionnaire survey (N = 265). This research is conducted among employees who were full-time employed and had overtime experiences in the previous six months in the Chinese mobile communications industry.

Results: The qualitative interview study indicated that overtime may have influences on the following major aspects: mental health including fatigue, depression, anxiety and stress, sleep quality, work-family conflict (WFC), and job-related outcomes including job satisfaction, turnover intention and work engagement. It also identified WTC, voluntary or compulsory overtime and rewards at work may exacerbate or mitigate the adverse influences of overtime. The quantitative study found that balance or imbalance between effort invested and rewards received at work did make a significant difference

on overtime employees' mental health, WFC and job-related outcomes. Additionally, in terms of WTC, both control over time – off and control over daily hours significantly influenced employees. Control over time-off seemed to have more influence on female than on male and on employees who have dependents than those who do not; control over daily hours similarly appeared to have more influence on female. Regarding voluntary and involuntary overtime, involuntary overtime correlated with increased mental health problems, WFC and decreased job-related outcomes whereas voluntary overtime had the opposite correlations. Dimensions of voluntary and involuntary overtime, namely workload, conformity, extrinsic motivation and intrinsic motivation made different explanations to mental health factors, WFC and job-related outcomes. Moreover, effort-reward imbalance (ERI) influenced involuntary overtime further affecting mental health, WFC and job satisfaction; WTC influenced voluntary overtime further affecting mental health, job satisfaction and work engagement. Finally, ERI moderated the relationship between overtime hours and job satisfaction; control over time-off significantly moderated the relationships between overtime hours and anxiety, stress, overall mental health, acute fatigue, intershift recovery, WFC, job satisfaction; control over daily hours moderated the relationship between overtime hours and anxiety, stress, overall mental health, WFC and job satisfaction; voluntary overtime significantly moderated the relationships between overtime hours and depression, anxiety, stress, overall mental health, chronic fatigue, acute fatigue, intershift recovery, WFC, job satisfaction and work engagement.

Conclusions: Effort-rewards balance, WTC and voluntary overtime could be considered as moderating factors that mitigate the adverse influence of overtime on employees' mental health, work-family conflict and job-related outcomes. The findings may have on the one hand, theoretical implications for occupational psychology, for example, findings regarding to voluntary overtime that is rarely investigated in previous studies provided the foundation and guidance for the future studies in terms of measurement, model and its potential effects associated with overtime; on the other hand,

practical implications for organizational overtime regulation and practices in the workplace, for example, the findings may enable organization to increase employees' WTC especially female to reduce stress and WFC when overtime is inevitable at work. In addition, the cultural influences were considered when reporting the research findings. For instance, even though employees are not evidently forced to work overtime, they may engage in involuntary overtime when their manager is still in the office after work.

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Table of contents

Abstract i

Acknowledgements iv

Table of contents v

List of Figures ix

List of Tables x

Abbreviations xiii

Chapter 1: Introduction 1

1.1 Overtime, Prevalence and Trends 1

1.1.1 What is overtime? 1

1.1.2 Overtime prevalence and trends in China 2

1.2 Harmful Impacts of Overtime 3

1.3 Effectiveness of Strategies to Reduce Overtime and Overtime's Effects 4

1.4 Summary and Outline 5

1.4.1 Summary 5

1.4.2 Outline of thesis chapters 6

Chapter 2: Literature Review 8

2.1 The Relationship between Overtime and Health, Work-family Conflict, and Job-related Outcomes 8

2.1.1 Health Problems 8

2.1.2 Work-family Conflict 10

2.1.3 Job-related Outcomes 11

2.2 The Moderating Effect of Rewards and Work time Control 12

2.2.1 Rewards 13

2.2.2 Worktime Control (WTC) 17

2.2.3 Interaction Effect 27

2.3 Cultural Context 27

2.3.1 Individualism 28

2.3.2 Collectivism 29

2.3.3 Differences in the Work Situation 30

2.3.4 Chinese Culture 32

2.3.5 Organizational Background 33
2.4 Aims & Hypothesis 34
2.4.1 Aims 34
2.4.2 Research Questions & Hypotheses 37
2.5 Concluding Summary 38

Chapter 3: Research Methodology 40

3.1 Introduction 40
3.2 Research Objectives and Research Questions 40
3.3 Research Design 43
3.3.1 Mixed Methods Research 43
3.3.2 The Qualitative – Quantitative Duality and Mixed Methods 45
3.3.3 Building a Mixed Methods Design 48
3.3.4 Quality Criteria for Mixed Methods 55
3.4 Data Sources 57
3.4.1 Qualitative Data Sources 57
3.4.2 Quantitative Data Sources 60
3.5 Ethical Considerations 63
3.6 Reflections about Implementation 67
3.7 Chapter Summary 70

Chapter 4: Study One Results and Discussion 71

4.1 Introduction 71
4.2 Method 72
4.2.1 Procedure 72
4.2.2 Participants 78
4.2.3 Data Analysis 79
4.3 Reflexivity 82
4.4 Results 87
4.4.1 Overtime Reasons (Why Do Overtime?) 87
4.4.2 Outcomes of Overtime 90
4.4.3 Influential Factors 100
4.4.4 Solutions to Overtime Challenges 107
4.5 Discussion 108
4.5.1 Summary of Findings 108
4.5.2 Comparison to Previous Research 110

4.5.3 Strengths and Limitations 118
4.5.4 New Findings and Research Implications 120

Chapter 5: Study Two Results and Discussion 123

5.1 Introduction 123
5.2 Method 130
5.2.1 Participants and Data Collection Procedure 130
5.2.2 Variables and Measures 133
5.2.3 Data Analysis 140
5.3 Results 144
5.3.1 Personal Demographics and Overtime Information 149
5.3.2 Reward, WTC and Involuntary and Voluntary Overtime in Relation to Health Problems, WFC and Job-related Outcomes 154
5.3.3 Mediation Effect of Involuntary and Voluntary Overtime 193
5.3.4 Moderation Effect of ERI, WTC and Voluntary Overtime 202
5.4 Discussion 218
5.4.1 Summary of Findings 218
5.4.2 Comparisons to Previous Research 224
5.4.3 Strengths and Limitations 238
5.4.4 Implications 240
5.4.5 Conclusion 243

Chapter 6: General Discussion 245

6.1 Summary of Findings 245
6.2 Strengths and Limitations 248
6.3 Implications 251
6.4 Conclusion 257

References 259

Appendixes 300

Appendix A Materials 300
A.1 Ethical Approval Letter 300
A.2 Invitation Email to Organization 301
A.3 Permission from the Organization 302
A.4 Interview Invitation Email 303
A.5 Questionnaire Survey Invitation Email 305

A.6 Participant Information 306
A.7 Participant Consent 312
A.8 Interview Guides 315
A.9 Interview Transcript 316
A.10 Questionnaires 321
Appendix B Full thematic framework 329

List of Figures

Figure 2.1 Moderation Model of Worktime Control, Rewards and Voluntary Overtime. 38
Figure 3.1 Qualitative – quantitative continuum. Source: Johnson et al. (2007 p. 124).. 47
Figure 3.2 Research Methodological Process 55
Figure 4.1 Factors Influencing Voluntary versus Involuntary Overtime and Consequences 122
Figure 5.1 Interaction Graph Showing the Effect of WTC on Anxiety at Two Groups of Reward..... 182
Figure 5.2 Interaction Graph Showing the Effect of WTC on Overall Mental Health at Two Groups of Reward..... 183
Figure 5.3 Interaction Graph Showing the Effect of WTC on Job Satisfaction at Two Groups of Reward..... 186
Figure 5.4 Observed Relationships between ERI, Involuntary Overtime and Depression 194
Figure 5.5 Observed Relationships between ERI, Involuntary Overtime and Anxiety ... 194
Figure 5.6 Observed Relationships between ERI, Involuntary Overtime and Stress 195
Figure 5.7 Observed Relationships between ERI, Involuntary Overtime and Mental Health 195
Figure 5.8 Observed Relationships between ERI, Involuntary Overtime and Chronic Fatigue 195
Figure 5.9 Observed Relationships between ERI, Involuntary Overtime and Acute Fatigue 196
Figure 5.10 Observed Relationships between ERI, Involuntary Overtime and Intershift Recovery 196
Figure 5.11 Observed Relationships between ERI, Involuntary Overtime and WFC 196
Figure 5.12 Observed Relationships between ERI, Involuntary Overtime and Job Satisfaction 197
Figure 5.13 Observed Relationships between ERI, Involuntary Overtime and Work Engagement 197
Figure 5.14 Observed Relationships between WTC, Voluntary Overtime and Depression 198
Figure 5.15 Observed Relationships between WTC, Voluntary Overtime and Anxiety . 199
Figure 5.16 Observed Relationships between WTC, Voluntary Overtime and Stress 199
Figure 5.17 Observed Relationships between WTC, Voluntary Overtime and Mental Health 199
Figure 5.18 Observed Relationships between WTC, Voluntary Overtime and Chronic Fatigue 200

Figure 5.19 Observed Relationships between WTC, Voluntary Overtime and Acute Fatigue 200
Figure 5.20 Observed Relationships between WTC, Voluntary Overtime and Intershift Recovery 200
Figure 5.21 Observed Relationships between WTC, Voluntary Overtime and WFC..... 201
Figure 5.22 Observed Relationships between WTC, Voluntary Overtime and Job Satisfaction 201
Figure 5.23 Observed Relationships between WTC, Voluntary Overtime and Work Engagement 201
Figure 5.24 Impact of ERI on the Overtime Hours – Job Satisfaction Relationship 203
Figure 5.25 Explanatory Effects of ERI, WTC, Involuntary and Voluntary Overtime on Mental health, WFC, and Job-related Outcomes..... 219
Figure 5.26 Mediating Effects of Involuntary and Voluntary Overtime 219
Figure 5.27 Moderating Effects of ERI, WTC and Voluntary Overtime 220

List of Tables

Table 4.1 Personal Demographics of Participants 78
Table 4.2 Overtime Hours of Participants 79
Table 4.3 Income of Participants..... 79
Table 4.4 Analysis Template..... 81
Table 4.5 Overtime Reasons 87
Table 4.6 Outcomes of Overtime 90
Table 4.7 Evidence-based Definitions and Symptoms of Depression, Stress and Anxiety93
Table 4.8 Influential Factors..... 100
Table 4.9 Solutions to Overtime Challenges 107
Table 5.1 Questionnaire Distributions and Response Summary 132
Table 5.2 Each Hypothesis and Relevant Result 146
Table 5.3 Personal Demographics of Participants 150
Table 5.4 Marital Status and Dependents Information of Female and Male Respondents 151
Table 5.5 Descriptive Information for Overtime Hours and Overtime Days 152
Table 5.6 Means and Standard Deviations and Correlations of the Measured Variables 153

Table 5.7 Compensation for Overtime Information 155
Table 5.8 Effort-Reward Imbalance Information 155
Table 5.9 Comparison of Without Overtime Compensation and Within Overtime Compensation in Mental and..... 157
Table 5.10 Hierarchical Multiple Regression Analyses Explaining Mental and Physical Health, WFC and Job-related Outcomes From ERI 160
Table 5.11 Overtime Control Information..... 162
Table 5.12 WTC Information..... 163
Table 5.13 Hierarchical Multiple Regression Analysis Explaining Mental Health Variables from Control..... 167
Table 5.14 Hierarchical Multiple Regression Analysis Explaining Chronic Fatigue, Acute Fatigue and Recovery From Control over Time-off 169
Table 5.15 Hierarchical Multiple Regression Analysis Explaining WFC, Job satisfaction and Work Engagement From Control over Time-off..... 171
Table 5.16 Hierarchical Multiple Regression Analysis Explaining Mental Health Variables from..... 175
Table 5.17 Hierarchical Multiple Regression Analysis Explaining Chronic Fatigue, Acute Fatigue and Recovery From Control over Daily Hours 177
Table 5.18 Hierarchical Multiple Regression Analysis Explaining WFC, Job satisfaction and Work Engagement from Control over Daily Hours 179
Table 5.19 Hierarchical Multiple Regression Analysis Explaining Mental Health Variables from ERI and WTC 181
Table 5.20 Hierarchical Multiple Regression Analysis Explaining Chronic Fatigue, Acute Fatigue and Recovery from ERI and WTC..... 184
Table 5.21 Hierarchical Multiple Regression Analysis Explaining WFC, Job satisfaction and Work Engagement from ERI and WTC 185
Table 5.22 Involuntary & Voluntary Overtime and Outcome Variables Correlations 187
Table 5.23 Hierarchical Multiple Regression Analysis Explaining Mental Health Variables from Involuntary 189
Table 5.24 Hierarchical Multiple Regression Analysis Explaining Chronic Fatigue, Acute Fatigue and Recovery from Involuntary and Voluntary Overtime 190
Table 5.25 Hierarchical Multiple Regression Analysis Explaining WFC, Job satisfaction and Work Engagement from Involuntary and Voluntary Overtime..... 191
Table 5.26 Involuntary & Voluntary Overtime – ERI ratio and WTC Correlations..... 193
Table 5.27 Coefficients for Control over Time-off as a Moderator of the Overtime Hours – Mental Health Factors Relationships 205
Table 5.28 Coefficients for Control over Time-off as a Moderator of the Overtime Hours – Acute Fatigue, Intershift Recovery, WFC and Job Satisfaction Relationships..... 208

Table 5.29 Coefficients for Control Daily Hours as a Moderator of the Overtime Hours – Mental Health Factors Relationships 210
Table 5.30 Coefficients for Control Daily Hours as a Moderator of the Overtime Hours – WFC and Job Satisfaction Relationships 212
Table 5.31 Coefficients for Voluntary Overtime as a Moderator of the Overtime Hours – Mental Health Factors Relationships 214
Table 5.32 Coefficients for Voluntary Overtime as a Moderator of the Overtime Hours – Fatigue and Intershift Recovery Relationships 215
Table 5.33 Coefficients for Voluntary Overtime as a Moderator of the Overtime Hours – WFC, Job Satisfaction and Work Engagement Relationships 217
Table 6.1 The Moderating Effect of ERI, WTC and Voluntary Overtime on the Relationships between Overtime Hours and Mental Health, WFC and Job-related Outcomes 248

Abbreviations

CI	Confidence interval
ERI	Effort – reward imbalance
FIW	Family interference with work
IQR	Interquartile range
JD-R	Job-Demands Resources
Mdn	Median
NIOSH	National Institute for Occupational Safety and Health
OR	Odds ratio
SD	Standard Deviation
SQRT	Square root
WIF	Work interference with family
WFC	Work-family conflict
WTC	Worktime control

Chapter 1: Introduction

This thesis considers what influences of overtime have on employees' mental health, work-family conflict and job-related outcomes and particularly focuses on whether Effort-Reward Imbalance (ERI) and worktime control (WTC) can act as moderators between overtime and these factors. The research was carried out in a mobile communication company located in China, which is a typical collectivist country; cultural factors that may affect issues relating to overtime are considered. This chapter provides a general introduction to overtime, its prevalence and influences, and the concept and theory of ERI and WTC and how they are related to overtime's impacts.

1.1 Overtime, Prevalence and Trends

1.1.1 What is overtime?

For employees who have regular working hours, overtime usually means the time worked beyond one's scheduled working hours that are stated in an employment contract (Fortune, 2017a). A generalized overtime definition refers simply to those hours spent outside of the standard working schedule. For instance, any hours worked by an employee which exceed the standard 40-hour work week are defined as overtime hour (Costa, 2000). Overtime commonly refers concurrently to the employee's compensation of such work. However, overtime is a multifaceted and deficiently defined concept, with research on the topic usually referring to its measurement, paid or unpaid overtime, voluntary or involuntary overtime, scheduled and unscheduled overtime (CMCC, 2018a).

Previous studies generally measured overtime in two major ways. Some studies measured overtime by overtime hours on an average weekday, namely how many hours an employee commonly spends on overtime work per day (Virtanen et al., 2010; Virtanen, Stansfeld, Fuhrer, Ferrie, & Kivimäki,

2012). However, the majority of previous research focused on the number of overtime hours weekly, namely subtracting the number of hours worked according to one's contract from the average number of actual working hours (Parkes & Prevention, 2017; Taris et al., 2011b; Van Der Hulst & Geurts, 2001).

In addition, in terms of the report of overtime hours, there are commonly two sources, namely self-report from the employee and records from the organization. Fewer studies, however, measured overtime hours from the organizational perspective as firstly, it is hard to achieve employees' overtime information from the organization's human resource management; secondly, the overtime records from the organization may be incomplete as some overtime work were conducted at home rather than in the work place; thirdly, regarding some job positions overtime hours may be not recorded as the compensation for long hours working is based on employees' performance or output not overtime hours. Therefore, self-report overtime is commonly used in previous studies (e.g. Beckers et al., 2008; J. Park et al., 2001; Shimizu, Horie, Nagata, & Marui, 2004).

This study involved full-time workers who had contractual working hours and the overtime hours were self-reported by measuring paid and unpaid overtime hours spent on overtime work weekly in the workplace and at home and not including commuting time. For a better comparison between studies, a consistent definition of overtime is needed in the future.

1.1.2 Overtime prevalence and trends in China

Under the impact of economic globalization, enterprise management is becoming more difficult. To maintain pace with the competition and to maximize profit, enterprises need to greatly reduce labor costs. Consequently, regular working hours are not enough to complete the required tasks at work. Overtime is becoming more and more prevalent and a sensitive issue (CMCC, 2018c). According to the Chinese talent development report NO. 3, China has

become one of the countries with the longest working time in the world, and the labor time per capita has exceeded Japan and South Korea (CMCC, 2018b). In particular, working overtime for IT workers has basically become a work practice in China (Bae, 2012).

In addition, cultural orientations lead to overtime working. Collectivist culture, particularly Chinese Confucianism may play an imperceptible role in the workplace from four major orientations associated with workplace attitudes and potential predictors of overtime behaviour by promoting either affective or normative motive (Kang, Matusik, & Barclay, 2015). Chinese usually perceive the group goal higher than the personal goal, so that they may choose to work overtime to complete the group work even though their own tasks have been completed (Siu, 2003). Management expectation pushes employees to work longer in order to meet manager's demands and maintain a harmonious relationship (L. Miles & Goo, 2013).

1.2 Harmful Impacts of Overtime

Recent prospective studies, although not entirely consistent, suggest that long working hours may increase the risk of various adverse outcomes on (a) physical health, including high blood pressure (Dahlgren, Kecklund, & Åkerstedt, 2006; Rau & Triemer, 2004), cardiovascular diseases (Landsbergis, 2004; J. Park et al., 2001), sleep disturbances (L. Miles & Goo, 2013; Virtanen et al., 2009); (b) mental health, including psychological distress and symptoms of depression and anxiety (Beckers, Kompier, Kecklund, & Härmä, 2012; Kleppa, Sanne, & Tell, 2008; Suwazono, Okubo, Kobayashi, Kido, & Nogawa, 2003), decline in cognitive function (Siu, 2003), and fatigue (Beckers et al., 2004; Sasaki, Iwasaki, Mori, Hisanaga, & Shibata, 2007; von dem Knesebeck & Siegrist, 2003); and (c) social effects, less time to attend non-work responsibilities, work-family conflict and complaints (Bohle, Quinlan, Kennedy, & Williamson, 2004; Tarumi, Hagihara, & Morimoto, 2003).

1.3 Effectiveness of Strategies to Reduce Overtime and Overtime's Effects

It is important to reduce and avoid unnecessary overtime work. To reduce overtime, it is essential to identify the overtime reasons and tailor package of measures. For instance, one obvious reason of working overtime is too much work. The employee's supervisor or manager and the employee should work together on analyzing and finding out what tasks cause overtime working and redistributing tasks or adding resources. In addition, too many meetings induce regular work hours not enough to get the job done. The manager should scrutinize all meetings to make sure their necessity and get vital employees attended (Levenson, 2017).

If overtime is inevitable, it requires exploring effective strategies to decrease the negative influences of overtime. Previous findings indicate that firstly, advancing time autonomy may decrease employees' disgust with overtime, ameliorate employees' recovery conditions between working hours, mitigate workers' stress and fatigue and enhance employees' work-life balance (Beckers et al., 2008; Kelly, Moen, & Tranby, 2011).

Worktime control (WTC) was defined as "an employee's perception of his/her possibilities to control the duration, position, and distribution of his/her working times" (Härmä, 2006, p.503). Theoretical support for the supposed advantages of enhanced worktime control originated from several motivational and occupational health theories. WTC can be assumed to facilitate the internal and external recovery process during and after work, which workers can adjust their effort and recovery according to their current situation for the need of recovery (Meijman, Mulder, Drenth, & Thierry, 1998). Self-Determination Theory, the Job Characteristics Model, and the Job Demands-Control Model, also indicate that WTC, a sub-dimension of general control, may promote employees' motivation, performance, and health, and decrease psychological distress, sickness leave and turnover intention (Beckers et al., 2012).

Secondly, improving compensation may stimulate employees' motivation, mitigate employees' complaints and improve employees' satisfaction consequently moderating the adverse influence of overtime on employees (Beckers et al., 2008; S. M. Park, Min, & Chen, 2016). From the perspective of Effort-Reward Imbalance (ERI) model, which is based on the notion of reciprocity of efforts spent and rewards received, rewards can be assumed to promote positive emotions. However, high effort and low rewards, which is seen as imbalance, may cause antagonistic emotions, pressure, exhaustion and less engagement (Niedhammer, Tek, Starke, & Siegrist, 2004).

Thirdly, social support may have an impact on employees' psychological distress. For example, chance for promotion could increase employees' working motivation and job satisfaction, learning opportunities of skill improvement could improve work efficiency and productivity accordingly reducing overtime and improving self-efficacy, and the right of decision on work pace may affect employees' work stress and recovery conditions (Moen, Kelly, Tranby, & Huang, 2011; Pomaki & Maes, 2002; Rhoades & Eisenberger, 2002; Vancouver, 2000).

1.4 Summary and Outline

1.4.1 Summary

Overtime causes substantial health issues, work-life conflict, and poses a significant economic cost on dealing with job-related outcomes; reducing overtime impacts is therefore a public and organizational priority. Since the improvement of overtime legislation and overtime compensation system, the overtime hours is restricted and overtime pay provisions are regulated. Previous research has described the trends in prevalence of overtime over the world, however there are no consistent findings about the relationship between overtime and mental health, work-life conflict and job-related outcomes.

Previous research has also explored moderating factors that are associated with overtime. The influence of overtime is not only based on overtime hours but also based on psychosocial factors, such as voluntary or involuntary overtime, overtime compensation, work conditions and social support. Greater understanding about the role of moderators on the relationship between overtime and mental health, work-family conflict and job-related outcomes is essential for the development of future, more effective, targeted interventions and measures to reduce the influence of overtime on employees.

1.4.2 Outline of thesis chapters

Chapter 2 identifies, through an extensive review of the literature, (1) the influences of overtime on employees from different perspectives, namely mental health, work-family conflict and job-related outcomes, and (2) the probable factors which may buffer the influences, namely WTC and rewards; explains the theoretical foundations of WTC and rewards.

Chapter 3 is a methods chapter. This describes the sequential mixed methods used to recruit participants, conduct the interview and online questionnaire survey, and further describe the analytical technique for data analysis.

Chapter 4 reports the results of study 1, namely qualitative interview, which explores the experiences and impacts of overtime on employees who were fully employed and had overtime experiences in the previous six months before the survey.

Chapter 5 reports the results of study 2, namely quantitative questionnaire survey, which investigates the relationship between overtime and mental health, work-family conflict and job-related outcomes, and the function of

factors on the relationship, including rewards, WTC and involuntary & voluntary overtime.

Chapter 6 summarises and discusses key findings from the research and highlights the implications for the development of future organizational interventions and policy to reduce overtime and overtime's negative impacts. It also analyses limitations of current study and recommendations for future research.

Chapter 2: Literature Review

Overtime is becoming a common and prevalent phenomenon in the current 'information age' and in today's industrialized countries, as major changes have taken place in the workplace, i.e. redundancy, new work time schedules, and fierce competition (see Kodz et al., 2003; Sparks, Faragher, & Cooper, 2001). Work has become more intense and fast-paced. Average working hours per week have lengthened in many cases because of extensive downsizing in large corporations, and many types of work can be done at any time and at any place. Even though most countries have set maximum weekly working hours, the legal weekly limit of working hours is still high, which in many regions includes not only a mandatory 40-hour, 5-day working week for example, but also often includes legal overtime hours during the week and even weekends (Messenger, Lee, & McCann, 2007). It is now well recognized that overtime work can induce increased risk of adverse mental health, work-family conflict, and poor job-related outcomes. The following sections discuss (1) the relationships between overtime and these outcomes, (2) the potential moderating factors on the relationships, (3) the cultural impacts, and (4) the research aims and hypothesis.

2.1 The Relationship between Overtime and Health, Work-family Conflict, and Job-related Outcomes

2.1.1 Health Problems

Preceding studies have suggested that long working hours could increase the risk of various health problems. Firstly, physical problems, such as cardiovascular problems (Park et al., 2001), high blood pressure (Dahlgren et al., 2006), myocardial infarction (Liu & Tanaka, 2002), back injuries (Sparks, Cooper, Fried, & Shirom, 1997), health complaints (Kawada & Ooya, 2005), and unhealthy weight gain (Caruso, Hitchcock, Dick, Russo, & Schmit, 2004); secondly, psychological problems, including stress (Åkerstedt, Fredlund,

Gillberg, & Jansson, 2002), fatigue (Beckers et al., 2004), psychological distress, anxiety and depression (Kleppa et al., 2008; Virtanen et al., 2012), decrease in cognitive function, and sleep disturbances (Virtanen et al., 2009); thirdly, adverse behavior and habits such as irregular diet, increased smoking, alcohol use, and lack of exercise, which further leads to health problems (Caruso et al., 2004; Suwazono et al., 2003; Van der Hulst, 2003).

Recently, recovery from work has received more attention, and it is considered as essential for maintaining health and work-life balance. According to the Effort-Recovery Model (Meijman et al., 1998), incomplete recovery could be induced by extended work hours, which could be explained through the two pathways: (i) time-based incomplete recovery, where employees may have less time to take a rest, enjoy family activities, and personal hobbies and exercise etc. (ii) strain-based incomplete recovery, where the quality of recovery may be reduced because of the extension of strain produced in long working hours. Employees may feel too tired to make an effort with, or take part in, family matters. Accumulated incomplete recovery may further result in increased health problems (Geurts & Sonnentag, 2006).

However, it should be also noted that results are not always consistent. Van Der Hulst and Geurts (2001) failed to find a significant association between psychosomatic health complaints and moderate overtime. Similarly, a previous meta-analysis study conducted by Sparks et al. (1997), showed a positive but low correlation between working hours and physical and mental health complaints. Otterbach, Fok, and Wooden (2016) claimed that whether the working hours were the workers' preferences is much more important for workers' well-being than the working hours. Therefore, to date, there is a relatively unified result about the negative association of overtime with physical health, such as hypertension and cardiovascular disease, whereas the relationship between overtime and mental health does not seem to be simple and straightforward; it seems to rely on the psychosocial characteristics of the

work, such as job demands, job variety, job control, and social support (Beckers et al., 2008).

2.1.2 Work-family Conflict

Long working hours is associated with work-family imbalance (Grzywacz & Marks, 2000; Hämmig & Bauer, 2009). According to Geurts, Beckers, Taris, Kompier, and Smulders (2009), four out of 10 workers suffered from balancing work demands and non-work demands. A survey conducted by Parent-Thirion, Fernández Macías, Hurley, and Vermeylen (2007), involving a representative sample of European employees, showed that working hours was one of the primary determinants affecting work-family balance. Furthermore, regular long work time and overtime were related to elevated work-family conflict, which not only exerted an adverse effect on employees themselves, but also on their partners' health and well-being (Geurts et al., 2009; Geurts & Demerouti, 2003). Similarly, a longitudinal cohort study, conducted by Jansen, Kant, Nijhuis, Swaen, and Kristensen (2004), revealed that long work time, overtime hours, and commuting time were positively associated with work-family conflict.

Long hours of work leads to inadequate time for family responsibilities, including taking care of children and parents, doing housework, and communicating with partners, as well as a decrease in life leisure (Bohle et al., 2004). Role conflict theory speculates that work and family are incompatible because of the distinct norms and requirements (Greenhaus & Beutell, 1985). The National Institute for Occupational Safety and Health (NIOSH) reported that work-to-family interference was one of the 10 major problems in the workplace (Kelloway, Gottlieb, & Barham, 1999).

Greenhaus and Beutell (1985) identified three forms of WFC, namely time-based WFC, strain-based WFC, and behaviour-based WFC. Subsequently, Gutek, Searle, and Klepa (1991) suggested that each of the three forms of

WFC has two directions: (1) work interference with family conflict (WIF) and (2) family interference with work conflict (FIW). According to previous findings, it is interesting that work interferes with the family more than the family interferes with work (Eby, Casper, Lockwood, Bordeaux, & Brinley, 2005; Geurts et al., 2005). This study focused on the impact of overtime work on employees' families as recent studies indicated that work-family enrichment was more strongly correlated with job-related outcomes (e.g. job satisfaction, turnover intention) (e.g. Gutek et al., 1991; McNall, Nicklin, & Masuda, 2010; Wayne, Musisca, & Fleeson, 2004; Wayne, Randel, & Stevens, 2006).

2.1.3 Job-related Outcomes

Long working hours would induce not only poor personal health, but also adverse organizational outcomes, such as burnout (Van Der Hulst & Geurts, 2001), increased turnover intention, absenteeism (Michie & Williams, 2003), decreased organizational commitment, low job performance (Adler et al., 2006), and job satisfaction (Brauchli, Bauer, & Hämmig, 2014). Considerable work impairment and absence days are caused by mental disorders after long periods of overtime work, which is considered as the detrimental factor (Demyttenaere et al., 2004; W. W. Eaton et al., 2008). High turnover intention, one of the poor job-related outcomes, induced increased organizational costs, such as loss of valuable human resources, disruption of ongoing activities, and regular recruitment and training (Sousa-Poza & Henneberger, 2004). Moreover, Otterbach, Wooden, and Fok (2016) found that low job satisfaction was obviously related to long working hours when workers were reluctant.

However, previous research tended to investigate the global measures of working time – such as the total number of hours spent on work, including contractual working hours, overtime hours, and commuting hours – whereas less focus was put on the specific and potentially distinct influences of separate dimensions of work-related time (Beckers et al., 2007). This study will focus on the overtime hours spent on work specifically. It seems that

overtime work influences workers' health and work-family balance equally or even more seriously than normal working hours. This may because workers are able to structurally schedule and arrange contractual working time in advance and exclude family and personal matters during this time. Nonetheless, overtime hours take up extra personal time originally reserved for family or other purposes. Overtime work is often implemented suddenly and unscheduled, which causes more stress and fatigue (Geurts et al., 2009).

Furthermore, regarding the relationship between overtime and the above variables, an increasing amount of research not only focuses on the effect of long working hours on organizations and employees, but also tries to explore the possible moderators to reduce the adverse influence of overtime work on employees' mental health, work-family conflict, and job-related outcomes, such as job characteristics and job control (e.g. Adams, 1965; Ala-Mursula et al., 2006; Bakker, Killmer, Siegrist, & Schaufeli, 2000; Beckers et al., 2008; Beckers et al., 2004; Brauchli et al., 2014; Calnan, Wainwright, & Almond, 2000; Geurts et al., 2009; Hino et al., 2015; Hughes & Parkes, 2007; Jansen et al., 2004; Kandolin, Härmä, & Toivanen, 2001; M. A. Kompier, 2006; Nijp, Beckers, Geurts, Tucker, & Kompier, 2012; Scandura & Lankau, 1997; Takahashi et al., 2011; Tucker, Bejerot, Kecklund, Aronsson, & Åkerstedt, 2015; Tucker & Rutherford, 2005; Valcour, 2007; Van Der Hulst & Geurts, 2001; Van der Hulst, Van Veldhoven, & Beckers, 2006).

2.2 The Moderating Effect of Rewards and Work time Control

Psychosocial job characteristics, such as job demands, job variety, and job control, are definitely parts of essential moderating factors that determine the extent to which overtime work imposes an adverse influence on employees' well-being (Beckers et al., 2008). Bakker and Demerouti (2007) reported, in the occupational health literature, that if employees were exposed to high demands while having low resources at their disposal, that job strain would occur because of the imbalance. By investigating a sample of

1,612 full-time Dutch workers, Beckers et al. (2008) reported that, compared to non-fatigued overtime employees, fatigued overtime employees reported comparatively adverse work characteristics, high job demands combined with low job control, and low job variety. Additionally, voluntary overtime workers have good working conditions, self-chosen overtime, and more job variety, as well as proper compensation. Similarly, Van der Hulst et al. (2006) claimed that moderate overtime hours were associated with fatigue on occasions of high job demands combined with low job control.

From work motivation (e.g. M. Kompier, 2003) and work time literature (e.g. Härmä, 2006), two predominant psychosocial work characteristics may act as moderators in the overtime-mental health, overtime-work-family conflict, and overtime-job-related outcomes associations, namely (1) rewards for effort and (2) work time control (WTC). The following section explains why rewards and work time control are focused on in this research in detail.

2.2.1 Rewards

2.2.1.1 Moderating Effect

Rewards may be assumed to play a moderating effect on the relationship between overtime and health, work-family conflict, and job-related outcomes (Beckers et al., 2008).

Rewards are positively related to employee health. Van Vegchel, De Jonge, Meijer, and Hamers (2001) reported that employees who invested high (psychological, physical, and emotional) efforts but received low rewards reported higher risks of psychosomatic health complaints, physical health symptoms and job dissatisfaction. Findings from Niedhammer et al. (2004) 1-year follow-up study highlighted the predictive effects of the imbalance between effort and reward on self-reported health. Siegrist et al. (2004) found that non-reciprocity, or imbalance, between high efforts spent and low rewards received induced chronic work-related stress.

Organizational rewards are positively associated with job-related outcomes. Mottaz (1985) highlighted the importance of rewards as a determinant for work satisfaction. Oliver (1990) reported the significant relationship between work rewards and commitment to the organization. Organizational rewards and favourable work conditions are beneficial to both employees (e.g. job satisfaction, positive emotions) and organizations (e.g. affective commitment, good performance, reduced turnover intention) (Rhoades & Eisenberger, 2002). Janssen (2001) indicated that employees who received effort-reward fairness were more satisfied and performed better than those who perceived unfairness that the rewards were lower than they should have received. In addition, a study investigating the international differences in job satisfaction, involving the longitudinal data from 1989 to 2005 across six countries (West Germany, Great Britain, the USA, Hungary, Norway, and Israel), clearly showed that intrinsic rewards explained the most variance in the respondents' job satisfaction (Westover & Taylor, 2010).

2.2.1.2 Theoretical Foundation

According to Janssen (2000) study, building on the Person–Environment Fit Theory and the Social Exchange Theory, it was suggested that the association between job demands and job-related behaviour was expected to be moderated by employees' perception of fairness between effort spent and rewards received at work. The Effort-Reward Imbalance (ERI) Model highlights the importance of rewards for overtime work (Siegrist, 1996, 1998). This theory emphasized the reciprocal association between effort and rewards at work. Employees expect fair rewards or compensation for their invested effort. Remuneration and rewards for overtime affects employees' willingness to invest efforts at work.

The central idea of this model is that an imbalance between (high) effort and (low) rewards contributes to continuous stress reactions. The mechanism is that the imbalance will stimulate strong negative emotions, which in turn

creates two stress axes, the sympathetic-adrenomedullary and the pituitary-adrenal-cortical system. In the long run, the physical (e.g. cardiovascular) and mental (e.g. depression) problems will occur because of the consistent activation of the autonomic nervous system (Van Vegchel, De Jonge, Bosma, & Schaufeli, 2005). This model greatly helps to explain overtime work situations where extra work effort is invested which may or may not be rewarded with fair rewards or compensation.

Firstly, the ERI postulates that an imbalance between high extrinsic effort and low rewards elevates the risk of poor health and well-being. A review of 45 studies on the ERI Model, for example, concluded that the ERI hypothesis was consistently supported by most studies related to cardiovascular disease (Van Vegchel, de Jonge, Bakker, & Schaufeli, 2002). ERI is associated with acute myocardial infarction (AMI) (Appels, Siegrist, & De Vos, 1997), emotional exhaustion, cynicism (Van Der Hulst & Geurts, 2001), and burnout (Bakker et al., 2000). Gaillard and Wientjes (1994) claimed that mental health could be predicted within the ERI Model, as ERI arouses strong negative emotions connected to well-being being damaged.

Secondly, scarce studies suggested that high effort-low rewards was related to elevated risk of work-home interference, such as reduced quality of life (de Jonge, Bosma, Peter, & Siegrist, 2000; Peter, Geißler, & Siegrist, 1998; Siegrist, 1996; Van Der Hulst & Geurts, 2001). High effort-low reward employees not only lack spare time with families and friends, spending time on hobbies, and doing other things to enjoy life, but are also short of money to spend on families and themselves.

Thirdly, ERI is associated with poor job-related outcomes, including job satisfaction, work motivation, depersonalization, and turnover intention (Bakker et al., 2000; Calnan et al., 2000; Derycke et al., 2010; Van der Doef & Maes, 1999). Furthermore, behavioral problems are also identified by the ERI Model, such as sickness absence, more smoking, and increased alcohol

consumption (Peter et al., 1998; Puls, Wienold, & Blank, 1998). According to the investment model, poor job-related outcomes, including job satisfaction, job commitment, and turnover intention, result from high job costs in combination with low job rewards (Rusbult & Farrell, 1983).

In the present study, three salient job-related outcomes will be investigated, namely job satisfaction, turnover intention, and work engagement. Locke (1969) [p.316] defined job satisfaction as "the pleasurable emotional state resulting from the appraisal of one's job as achieving or facilitating the achievement of one's job values". Job satisfaction may be both intrinsic – derived from internally mediated rewards such as the job characteristics and opportunities for personal growth and accomplishment – and extrinsic, resulting from externally mediated rewards such as satisfaction with pay, company policies and support, supervision, colleagues, chances for promotion, and customers (Walker, Churchill, & Ford, 1977).

Farrell and Rusbult (1981) indicated that job satisfaction and turnover intention were predicted by the cost and reward values of the job. Derycke et al. (2010) found that ERI at work was a significant predictor of turnover intention among health care workers. When suffering a high ERI situation, workers would cognitively and behaviourally potentially seek to contribute less effort or maximize rewards (Van Vegchel et al., 2005). This can be treated as a homeostatic regulation process involving self-regulation processes so as to deal with situations of psychological imbalance caused by stressors at work (Pomaki & Maes, 2002; Vancouver, 2000). Generating turnover intentions could be seen as one way of managing an ERI state. In addition, increase of withdrawal behaviour and reduction of commitment and engagement were ways to cope with persistent disequilibrium (Godin & Kittel, 2004). Maslach and Leiter (2008) demonstrated that the incongruity between input and output could be seen as unfairness that would induce burnout while, on the contrary, congruity motivates employees to engage in their work.

2.2.1.3 Gaps in the literature relating to effects of rewards on outcomes

Therefore, based on the ERI theory, it is assumed that overtime work is highly related to adverse mental health, work-life interference, and poor job-related outcomes, particularly under the situation where no or fewer rewards are compensated for employees' extra effort. However, findings are not always consistent. Hino et al. (2015) failed to find the buffering effect of extrinsic rewards on the association of overtime hours with psychological distress in employees who had high rewards compared to those with low rewards. The explanation for the result was that broader aspects were included in extrinsic rewards, such as promotion opportunities and esteem, which may not like work time control that is necessarily related to recovery process from overtime.

2.2.2 Worktime Control (WTC)

2.2.2.1 Moderating Effect

In addition to ERI, WTC, another important psychosocial characteristic, may also play a moderating effect on the relationship between overtime and mental health, work-family conflict, and job-related outcomes. During the past decades, work-related flexibility in organizational practice has received greater attention (M. A. Kompier, 2006). Job control is related to the extent to which workers can decide how, when, and where to do their jobs. Job control could be considered as a key factor that can reduce the detrimental effect of overtime work on employees' health and work-life interference and, in turn, optimize organizational outcomes (Brauchli et al., 2014). 'Temporal flexibility' has become a popular type of flexibility, such as work time control (WTC). Regarding work time flexibility, two types – namely company-based and employee-oriented flexibility – are distinguished in the literature (Åkerstedt & Kecklund, 2005; Ala-Mursula, 2006; G. Costa et al., 2004; Härmä, 2006; Joyce, Pabayo, Critchley, & Bambra, 2010). The former refers to "the need of employers to extend, modify, or reduce work hours according to client or production needs" (Härmä, 2006, p. 503). Shift work and compulsory

overtime are well-known examples. Employee-oriented work time flexibility refers to decision latitude regarding work time autonomy to adjust the work schedule to meet employee needs (Knauth, 1998).

WTC, which is supposed to act as a specific type of job control, has been defined as "an employee's possibilities of control over the duration, position, and distribution of work time" (Härmä, 2006, p. 503). Global WTC refers to the overall work time flexibility and schedule control. Additionally, there are multidimensional WTC forms. Well-known sub-dimensions include control over (1) Flextime: When to start and end the time of the workday, (2) The distribution of workdays over the work week, (3) Break control: When to take a break, (4) Leave control: When to take vacations or a day off, and (5) Overtime control: Whether and when to work overtime (Nijp et al., 2012).

The rationale for this study concentrating on work time flexibility is based on work-family conflict literature which suggests that work time control may be more efficient than workplace flexibility in mitigating work-family conflict (Byron, 2005; Mesmer-Magnus & Viswesvaran, 2006; Shockley & Allen, 2007).

WTC has been indicated to ameliorate some of the detrimental effects of high job demands. It buffers the influences of long work hours on poor physical and mental symptom frequency (e.g., Takahashi et al., 2011; Tucker & Rutherford, 2005), work-family interference (e.g., Geurts et al., 2009; Hughes & Parkes, 2007; Jansen et al., 2004; Kandolin et al., 2001; Valcour, 2007), sickness absence (e.g., Ala-Mursula et al., 2006) and job satisfaction (e.g., Beckers et al., 2008). A systematic review by Nijp et al. (2012) also highlighted the importance of WTC for employees which can be identified as a predictor of health issues (i.e. burnout and sleep), work-life balance, and several job-related outcomes (i.e. job satisfaction, attitudes, and turnover). Low work time decision latitude was related to physical diseases and health problems, distress, burnout symptoms, work-life imbalance, and dissatisfaction (Fenwick & Tausig, 2001).

Firstly, WTC is beneficial to health. Hino et al. (2015) suggested that significant higher psychological distress for long overtime compared to short overtime only happens in low job control situations, whereas there was no significant relationship between overtime hours and psychological distress among high job control employees. Depressive symptoms are significantly reduced within high control over daily working hours compared to low and moderate levels (Takahashi et al., 2011). Żołnierczyk-Zreda, Bedyńska, and Warszewska-Makuch (2012) found employees working long hours but having high work time control reported a significantly lower level of mental health problems (e.g. somatic complaints and anxiety) than workers with low work time control.

However, a lack of autonomy within determining the duration and position of work time may elevate the risk of sleep disturbances among employees (Salo et al., 2014; Takahashi et al., 2011; Tucker et al., 2015). Low work time control is significantly correlated with greater stress (Tucker et al., 2015). Through a stream of longitudinal cohort studies, Ala-Mursula and colleagues found that lack of WTC contributed to increased risks of health problems, while high work time autonomy decreased the adverse influence of overtime work on sickness absence and was beneficial in improving the balance of work and life (Ala-Mursula et al., 2006).

Secondly, increased WTC can help improve work-life balance. Work-family balance is positively influenced by increasing employees' schedule control (Ala-Mursula et al., 2006; Anderson, Coffey, & Byerly, 2002; Hammer, Allen, & Grigsby, 1997; Kelly et al., 2011; Kossek, Lautsch, & Eaton, 2006). Similarly, Lingard, Francis, and Turner (2012) reported that WTC was positively correlated with work-family enrichment. An intervention study, conducted by Albertsen et al. (2014), suggested that implementation of self-rostering facilitated employees' work-life balance.

Lee, MacDermid, and Buck (2002) even claimed that the promotion of flexible work schedules particularly aimed to motivate employees' work-life balance. Employees enjoy the benefits of work time autonomy to meet the demands of their work and personal lives. Therefore, organizations expecting to attract and retain talented employees could provide specific policies within a supportive work environment that enables employees to balance work and family (Grzywacz & Butler, 2005).

Finally, previous studies indicated that WTC was positively related to job-related outcomes. An increase in work time flexibility is positively associated with productivity and job satisfaction and negatively correlated with turnover intention (Allen, 2001; Baltes, Briggs, Huff, Wright, & Neuman, 1999). Similarly, Batt and Valcour (2003) found flexible schedule implications predicted lower turnover intention in organizations. Self-determination over working time is positively associated with job satisfaction and organizational commitment (Chen, Zhang, Leung, & Zhou, 2010). Flexible work time design not only benefits employees' personal development and learning opportunities, but also positively improves company's benefits, such as reduced absenteeism (Ala-Mursula, Vahtera, Kivimäki, Kevin, & Pentti, 2002; Ala-Mursula et al., 2006; Ala-Mursula, Vahtera, Linna, Pentti, & Kivimäki, 2005) and higher work quality (Kauffeld, Jonas, & Frey, 2004).

2.2.2.2 Theoretical Foundation

From a theoretical perspective, various mechanisms could help to explain the buffering effect of WTC on the association between overtime work and indicators of health and well-being, work-family conflict, and performance: A time-regulation mechanism, a recovery-regulation mechanism, the Person-Environment (P-E) Fit theory, and the Social Exchange theory.

Firstly, in terms of the time regulation, given the well-established adverse influence of overtime work on mental health, it seems likely that those who work overtime often will gain the most benefit from being able to determine

how and when their overtime work is scheduled to match their personal circumstances and their own life demands and to maximize the opportunities to recover from overtime work. For example, the employee could leave the workplace earlier to attend a parent meeting at school or take a short break during the workday to bring their parents to see the doctor. Additionally, it may be that compulsory overtime work restricts employees' ability to effectively adapt their preferred work time (e.g. by varying the start and finish times). Employees with flexible WTC may be better able to adjust work-life balance and the work-sleep cycle (Tucker et al., 2015). Baltes et al. (1999) claimed that high flextime was significantly positive in reducing overtime.

The Effort-Recovery model, another mechanism, helps to explain that the lack of WTC is related to fatigue after working overtime without an appropriate rest. The recovery process is the period after exposure to workload and effort investment when psychobiological systems will stabilize for a certain period. A particularly useful study by Rissler (1977) provided a deep insight into the physiological mechanism, describing how long work influenced health and well-being. This study found that higher levels of adrenaline and a higher heart rate, as well as feelings of fatigue and irritation, occurred during rest under high workload conditions. It also found that after 9 weeks of overtime, 5 weeks' recovery period was required for the physiological system to return to the normal value. In addition, employees prefer to invest further effort and work overtime on the condition that job tasks can stimulate their positive affect and intrinsic motivation. Nevertheless, if employees are not triggered by the work tasks and are forced to work overtime, aversion will occur, in which situation compensatory effort is needed to cope with job demands and, as a result, must be accompanied by more recovery time (Van Der Hulst & Geurts, 2001).

According to the Effort-Recovery Model, adverse consequences of overtime rely on the possibilities for recovery during the work (internal recovery) and after work (external recovery), which is related to break control during the

work and leave control outside work. WTC can be assumed to act as an essential factor in deterring employees from workload and keeping an appropriate effort-recovery balance. It may possess a particularly important recuperative value. For instance, high flextime enables employees to decide the time that work ends before they become too fatigued; a tired employee could take a day-off within high leave control. Low or no job time control restricts employees adapting their work time and rest time to their current situation for recovery, inducing an accumulation of fatigue. Specifically, for example, high break control is beneficial to internal recovery and leave control helps to improve external recovery. Tucker et al. (2015), for example, found that physicians who lacked WTC suffered more fatigue after long shift work than those who had WTC.

Thirdly, the Person-Environment (P-E) Fit theory can be used to better illustrate the association between schedule flexibility and workers' health, especially the emphasis on putting work demands based on workers' abilities and available sources (Edwards, 1996). Schedule flexibility enables the worker to possess the basic resources to balance role demands both in work and family domains (Voydanoff, 2005). Reduced stress will originate from work-family conflict by appropriately managing distinct role demands in life, which, in turn, will be conducive to positive mental health and better performance.

Finally, the Social Exchange theory provides a useful perspective to understand the positive effect of WTC on job satisfaction and turnover intention. According to the Social Exchange theory, when one party perceives favorable treatment, it feels responsible to reciprocate (Rhoades & Eisenberger, 2002). This explains the situation that when employees realize that they receive diversified sources from their organizations to promote work-family balance, the norm of reciprocity enforces them to pay back with favorable behavior and attitudes such as engagement and positive feelings

about the job and the organization (Aryee, Srinivas, & Tan, 2005; Wayne et al., 2006).

2.2.2.3 Gaps in the literature relating to the effects of work time control on outcomes

Nonetheless, the limited findings are inconsistent. A recent systematic review on the association between WTC and health/well-being, work–non-work balance, and job-related outcomes conducted by Nijp et al. (2012), with respect to cross-sectional studies, firstly showed inconsistent evidence for a positive relationship between global WTC and health/well-being; secondly, it provided strong evidence for a positive association between global WTC and work-non-work balance; thirdly, it provided moderately strong evidence for a positive relation between global WTC and job-related outcomes (e.g. job satisfaction). Even though previous studies have demonstrated the positive relationship between WTC and better heath, the evidence of whether WTC can exert a significantly positive influence on mental health is still limited, such as on stress and burnout (Tucker et al., 2015).

Moreover, it should be noted that the definition and measurement of WTC differed in previous research. Some studies focused on the global effect of WTC, which is average control over both work hours and non-working hours (e.g. days off) (Ala-Mursula et al., 2002; Ala-Mursula, Vahtera, Pentti, & Kivimäki, 2004; Butler, Grzywacz, Ettner, & Liu, 2009; Grzywacz, Casey, & Jones, 2007; Hughes & Parkes, 2007; Valcour, 2007). Some studies assessed the two controls respectively (Ala-Mursula et al., 2005; Geurts et al., 2009). The others only explored the working hour control (Ala-Mursula et al., 2006; Sandmark, 2007). Few previous studies investigated the specific sub-dimensions of WTC in relation to health/well-being and work-family conflict, as well as job-related outcomes. There is a paucity of evidence regarding the separate sub-dimensions of WTC – including flextime, break control, and leave control (control over days off or holiday) – as well as overtime control. Ambiguity in the measurement of WTC undermines the ability to clearly interpret

relationships between WTC and outcome variables, which further impedes the possibility to apply the research findings into advocacy and practice.

Flextime

According to a systematic review conducted by Nijp et al. (2012), in terms of flextime, firstly, two out of three cross-sectional studies – Takahashi et al. (2011) and Grzywacz, Carlson, and Shulkin (2008) – found a positive association with health/well-being. However, Lapierre and Allen (2006) failed to find the differences between workers who had flextime and those who did not in affective well-being. Secondly, three out of eight studies, namely Carlson, Grzywacz, and Michele Kacmar (2010), Hornung, Rousseau, and Glaser (2008), and Schieman and Young (2010) reported significant positive associations with work–non-work balance, while five studies reported no significant association. Finally, of four studies, two found a positive association between flextime and job-related outcomes, job satisfaction, and organizational commitment (see Mennino, Rubin, & Brayfield, 2005; Scandura & Lankau, 1997), whereas Carlson et al. (2010) reported combined results (positive association with job satisfaction, no association with self-reported job performance) and one study (see Hornung et al., 2008) reported no association.

Break Control

Regarding break control, even though two studies (see Bergqvist, Wolgast, Nilsson, & Voss, 1995; Hanse & Winkel, 2008) examined its relationship with health/well-being, on the one hand, the results were inconsistent on musculoskeletal symptoms and, on the other hand, only the latter reported the higher general well-being in the condition of break control. Almost no study examined its association with work-family conflict. In relation to job-related outcomes, the specific effect of break control can only be found in Hanse and Winkel (2008) study on job satisfaction.

Leave Control

Leave control includes the scheduling of vacations and paid days off as well as the taking of unpaid leave. In terms of this specific sub-dimension of WTC, previous evidence is especially scarce. Regarding health/well-being, of two cross-sectional studies, the findings were not convergent; one (see Takahashi et al., 2011) showed a positive relationship between leave control and health as well as affective well-being, whereas the other (see Eriksen & Kecklund, 2007) reported no association with affective well-being and general health. Only two cross-sectional studies found a positive association between leave control and work–non-work balance (see Geurts et al., 2009; Jansen et al., 2004). To the researcher's knowledge, no studies were found that explored the association between leave control and job-related outcomes.

Overtime Control

Overtime control, a specific dimension of WTC, suggests whether employees have the decision right to determine whether to work overtime or not. Voluntary and involuntary (compulsory) are two opposite poles of overtime control, signifying high and low overtime control respectively (Beckers et al., 2008). Golden and Wiens-Tuers (2005) stated that mandatory overtime happened in the situation where employees were compelled to work overtime by their employer or supervisor and, if they refused, they would suffer a penalty, either explicit or implicit. Even though employees sometimes work overtime voluntarily, more overtime hours are forced than they would have preferred. In addition, it should be a concern as to whether the mandatory overtime is scheduled far enough in advance that employees are able to plan for it, or if it is assigned at the last minute and difficult to plan for, which would cause more stress and fatigue.

Previous studies have provided evidence that voluntary or compulsory overtime may cause distinct consequences on employees (Beckers et al., 2004; M. A. Kompier, 2006; Spurgeon, Harrington, & Cooper, 1997; White & Beswick, 2003). Van Der Hulst and Geurts (2001) suggested that employees usually

experience fatigue when they are reluctant to invest further effort. Compulsory (i.e. low overtime control, involuntary) overtime employees had elevated work-home interference and low job satisfaction (P. Berg, Kalleberg, & Appelbaum, 2003; Golden & Wiens-Tuers, 2005). Moreover, compulsory overtime work can decrease possible happiness stimulated by payment for overtime (Golden & Wiens-Tuers, 2006). Tucker and Rutherford (2005) found that impaired health only happened among employees who worked und pressure (i.e. low overtime control) and who received less social support. In addition, it should be noted that the combined consequence of sub-dimensions could be exacerbated. For example, employees who are forced to work overtime experienced elevated risk of fatigue and stress if they also lack control over the hours (P. Berg et al., 2003; Bliese & Halverson, 1996).

Overall, the previous findings are limited and inconsistent. Only two studies focused on the association between overtime control and health/well-being; one by Beckers et al. (2008), found a positive association between overtime control and low fatigue, whereas the other, Tucker and Rutherford (2005), merely found a positive association with general health, and no relation with affective well-being or fatigue. Skinner and Pocock (2008) found moderate but small effects of control over work scheduling on work-life conflict. No study specifically investigated the overtime control with work-family conflict. Only the same study – Beckers et al. (2008) – found a positive association between overtime control and one factor of job-related outcomes, job satisfaction. In addition, apart from cross-sectional studies, the evidence for longitudinal and intervention studies is still limited (Joyce et al., 2010; Nijp et al., 2012).

Therefore, despite the above promising findings, a definite and broader conclusion in relation to the association between the specific sub-dimensions of WTC and three aspects – namely mental health, work-family conflict, and job-related outcomes – cannot be drawn because extremely limited and divergent results are provided. The conclusion that employee WTC potentially

favourably influences employee mental health, work-life balance, and job-related outcomes is still tentative. It is challenging to interpret these relationships. Therefore, further research is required to assess which sub-dimensions of WTC could contribute to employees distinctively.

2.2.3 Interaction Effect

To the researcher's knowledge, few studies have looked at the combined effect of rewards and WTC in the overtime-mental health, work-family conflict and job-related outcomes relationship. One – Van Der Hulst and Geurts (2001) – reported that involuntary overtime in combination with low rewards for overtime was associated with increased risks of psychosomatic health complaints, poor recovery, burnout (including exhaustion and cynicism), and adverse work-home imbalance. It even showed that compared to high rewards-low pressure overtime employees, high rewards-high pressure overtime employees experienced no elevated risks of negative mental health, indicating that as long as the rewards were high, high pressure may be not associated with higher mental health problems. However, this is an isolated study, so whether this finding could be extended should be further investigated.

2.3 Cultural Context

This study will be carried out in the Chinese cultural context to investigate whether the findings based on the Western cultural context can be applied to different countries within a distinct culture. Referring to the Western and Asian cultural differences, individualism and collectivism are conceptualised as two opposite cultural contexts (Hui, 1988). Social scientists claim that individualism is more prevalent in industrialized Western societies than in other societies, especially more traditional societies in developing countries.

2.3.1 Individualism

Individualism results from Protestantism and the process of civic emancipation in Western societies, involving individual choice, personal freedom, and self-actualization (Inglehart, 1997; Sampson, 2000). The primary idea of individualism is the assumption that individuals are independent of one another. In the individualist cultural context, people 'view themselves as independent of collectives; are primarily motivated by their own preferences, needs, [and] rights, … and emphasize the rational analysis of the advantages and disadvantages to associating with others', whereas in the collectivist cultural context, individuals typically 'see themselves as parts of one or more collectives (family, co-workers, tribe, nation); are primarily motivated by the norms of, and duties imposed by, those collectives; … and emphasize their connectedness to members of these collectives' (Triandis, 1995, p. 2).

Hofstede (1980) defined individualism as a focus on rights above duties, a concern for oneself and immediate family, an emphasis on personal autonomy and self-fulfillment, and the basing of one's identity on one's personal accomplishments. Waterman (1984) defined normative individualism as a focus on personal responsibility and freedom of choice, living up to one's potential, and respecting the integrity of others. Schwartz (1990) defined individualistic societies as fundamentally contractual, consisting of narrow primary groups and negotiated social relations, with specific obligations and expectations focusing on achieving status. All these definitions emphasize personal goals, personal uniqueness, and personal control, and peripheralize the social (Bellah, Madsen, Sullivan, Swidler, & Tipton, 2007; Hsu, 1983; Kâğitçibaşi, 1994; Markus & Kitayama, 1991; Triandis, 1995).

The consequences of individualism on psychology focus on the elements of self-concept, well-being, attribution style, and relationality. Firstly, with regard to self-concept, individualism suggests that (a) human beings endeavour to create and maintain a positive sense of self (Baumeister, 1998);

(b) unique and distinctive personal attitudes and opinions are considered valuably (Triandis, 1995); (c) abstract traits are core elements to self-definition (Kanagawa, Cross, & Markus, 2001). Secondly, with regard to well-being, individualism implies that free emotional expression and personal goal achievement are essential determinants to well-being and life satisfaction (Diener, Diener, & Diener, 1995). Thirdly, in terms of attribution style, individualism means that a person is primarily concerned about judgment, reasoning, and causal inference rather than the situation or social context (Choi, Nisbett, & Norenzayan, 1999). Finally, with regard to relationality, individualism suggests equality between costs and benefits is the measurement that individuals usually apply. When they perceive unfairness and imbalance about what they invest compared to what they receive in the workplace, intention to leave may arise. Therefore, in the individualism context, relationships are impermanent and lacking certainty (Bellah et al., 2007).

2.3.2 Collectivism

The core standpoint of collectivism is that individuals are group members with mutual obligations. In collectivist societies, there is a centralization of common fate, common goals, and common values. The person is merely a component of the society. It is crucial to analyze the personal role in a group and the relationships between members (Triandis, 1995).

The consequences of collectivism for psychology on self-concept, well-being, attribution style, and rationality are evident. Firstly, in terms of self-concept, collectivism suggests that (a) the role in the group or society is the key element to help understand the person (Markus & Kitayama, 1991); (b) personal traits which can assist collective unified goals are valued, such as individual sacrifice for the group goal achievement and contributions towards maintaining harmonious inter-group relationships (Triandis, 1995). Secondly, regarding well-being, collectivism implies that (a) a person acquires life

satisfaction when performing the social roles well and avoiding failures (Markus & Kitayama, 1991); (b) personal emotional expression is restricted to some extent to maintain in-group harmony, which is perceived as valuable and meaningful. Thirdly, in terms of judgment, reasoning and attribution style, collectivism implies that (a) individual perception and reasoning is determined mainly by social context, situation, and social roles; (b) meaning depends on the context and situation (M. W. Morris & Peng, 1994). Finally, in terms of relationality, collectivism suggests that (a) individuals should adjust to the common and fixed group goals; (b) there is a clear and relatively impermeable boundary between in-group and out-group; (c) equality (equal sharing) rather than equity (performance-based) is the basis for distribution (M. Morris & Leung, 2000; Triandis, 1995).

2.3.3 Differences in the Work Situation

Distinct influences of individualism and collectivism are embedded deeply in the work situation. In the individualist context, employees are motivated to work based on their interests as well as the accordance between individual interests and the employer's interests. In the collectivist context, the employer expects their employees to consider themselves as parts of the group. The group goal is much more important than personal interests, so if the personal goal does not coincide with the unified goal, employees are expected to abandon their own needs at certain times to pursue the common goal.

In the collectivist culture, the term of morality is the core of the relationship between the employer and employees. They have mutual obligations to maintain the loyalty, which resembles a family relationship, especially for the permanent employees. It is hard to dismiss employees because of poor performance. In the individualist culture, personal benefits are the primary determinant to the relationship between the employer and employees, which is regarded as a business transaction. It is legitimate and socially accepted on

the condition that employees' poor performance leads to dismissal, and acceptable for employees to leave the present company and move to another company which provides better pay.

With regard to the relationship with others, there are significant differences in the individualist and collectivist context. To the individualist mind, universalism is the norm that all are treated similarly. However, in collectivist societies, business relationships are treated distinctively between members in the same group and in the out-group. It is seen as unfair and unethical for customers to use interpersonal relationships to receive specific treatment in individualist societies, whereas it is acceptable that friends or intimate family members receive preferential treatment in collectivist societies. In individualist societies, the organization and tasks are the primary consideration prior to the consideration of any individual relationship; on the contrary, in collectivist societies, personal relationship establishment is a critical factor which is the basis of the organization and tasks (T. Clark, Eckhardt, & Hofstede, 2003).

For instance, according to a report by Leung and Bond (1984), Chinese behaviour in the collectivist culture depended much more on the context than American behaviour in the individualist culture. The report was based on two experiments with Chinese psychology students and American psychology students, investigating the opinion of sharing rewards with in-group members in the first experiment and with out-group members in the second experiment. There were two choices, equity (performance based) and equality (equal sharing) to be carried out under a) private conditions and b) public conditions. With regard to in-group members, Americans always chose equity regardless of the private/public context, whereas Chinese chose that rewards were equally shared with in-group members. Regarding out-group members, Chinese chose equity in the private response and equality in the public response, whereas this made no difference for Americans who always chose equity regardless of the private/public context. This means there were

differences between the American and Chinese sample regarding equality/equity behaviour towards the relevant in-group and for the Chinese sample, behaviour towards the out-group changed depending on whether the context was public or private.

However, organizational culture is not totally influenced by pure individualism or collectivism. In collectivist countries, if employers do not comply with the mutual obligations, in turn, employees will not be loyal to them. With more fierce competition, there is a decreasing emphasis on permanent contractual jobs, which means the employer could terminate the work relationship with employees because of their poor performance. Additionally, in individualist countries, some organizations have paid much more attention to fostering in-group relationship among their employees.

2.3.4 Chinese Culture

Chinese culture, a specific collectivist culture, has being influenced predominantly by Confucianism, which stemmed from China around 500 B.C, contributed by the philosopher Confucius. The core concept of Confucian culture is “virtue as the foundation, group as the importance, and harmony as the quintessence” (Mingyan, 2012, p. 79). The Confucian culture focuses on four components: Seniority orientation, relationship orientation, righteousness orientation, and benevolence orientation. According to Meyer and Allen (1991), it is recognized that there are two types of stimulators, namely affective motive (intrinsic motivation) and normative motive (extrinsic motivation) (Kang et al., 2015). Affective motive indicates employees’ positive emotional status toward their work and job roles and normative motive is conceptualized as employees’ intention to work on distributed tasks as a result of the consciousness of obligation. Seniority and relationship are conceptualized as the normative orientation. Righteousness and benevolence are conceived as the affective orientation.

Confucian culture, which has a profound influence on Asian culture, also has a crucial influence on workplace attitudes and potential predictors of overtime behaviour by promoting either affective or normative motive (Kang et al., 2015). Profoundly influenced by the specific cultural context, Chinese workers potentially conceive the group goal higher than their own needs. Firstly, with regard to seniority orientation, when the employer or the supervisor asks their employees to do extra work, it is hard for employees to refuse, and they usually work longer to show their loyalty. There is a tradition that subordinates usually leave the office later than their supervisor to show respect and loyalty, which happens more in government offices.

Secondly, with regard to relationship orientation, Chinese workers may perform not only explicit roles, but also implicit roles (Luo, 1997). Under heavy job demands, they may feel obligated to work overtime consciously to achieve the group goal. Under such conditions, some employees view this long working as an interruption to their own life time; conversely, some Chinese employees work overtime voluntarily to pursue the accomplishment of the group goal, considering that their extra investment could indicate their affective commitment to the group and will be beneficial for future development. Thirdly, with regard to righteousness orientation, Asian workers believe they should devote their life and be diligent to pursue perfection in their job, which arouses the affective motive to work overtime. Lastly, with regard to benevolence, employees see themselves as part of the group and thus pursue emotional satisfaction and achievement within the group. Therefore, they are motivated to work overtime for the collective goals by intrinsic motivation.

2.3.5 Organizational Background

This study was carried out in a branch of China Mobile Communications Corporation in Shan Xi, China. China Mobile Communications Corporation (hereinafter referred to as 'China Mobile'), was founded on 20 April, 2000,

and is a mobile communications operator based on GSM (Global System for Mobile communication), TD-SCDMA (Time Division-Synchronous Code Division Multiple Access), and TD-LTE (Time Division Long Term) system network. China Mobile is state-owned backbone enterprise, established according to the national telecom system reform as the deployment and requirements of the former China telecom mobile communications on the basis of overall stripping assets. In 2017's global 500 companies, China Mobile ranked No. 47 (Fortune, 2017b). In 2017's top 500 companies in China, it ranked No. 6 (Fortune, 2017a).

China Mobile established 31 wholly-owned subsidiaries in 31 domestic provinces (autonomous regions and directly-administered municipalities) and was listed in Hong Kong and New York (CMCC, 2018a). China Mobile is an integrated telecommunications operator which provides full-service telecommunications services in Mainland China and Hong Kong Special Administrative Region, including mobile business, wireline voice and wireline broadband businesses, corporate customer business, international business, and customer services (CMCC, 2018c). China Mobile is dedicated to upgrade core competences and spread their tenets of "centralised management, operational specialisation, market-oriented mechanism, lean organisation structure and process standardisation" (CMCC, 2018b). It has invested heavily and achieved remarkable results over the years.

2.4 Aims & Hypothesis

2.4.1 Aims

The current major challenge is how to cope with long working hours and how to reduce the adverse influences of overtime work on employees' health, work-life balance, and job-related outcomes. Following these concerns, in terms of overtime, research has moved from demonstrating overtime's adverse influences towards exploring the possible moderating factors

between overtime and three related aspects. However, research on the buffering effect of some job sources (e.g. work time control and compensation for overtime work) on the association of overtime work with mental health, work-family conflict, and job-related outcomes, is still limited and inconsistent.

The number of preceding studies on the individual dimensions of WTC was too scarce to provide sufficient evidence for a positive association and a firm conclusion cannot be drawn from the findings. Moderately strong cross-sectional evidence was found for a positive causal association between WTC and work-family conflict, whereas no convergent evidence was found for health/well-being and job-related outcomes. To explore which sub-dimensions of WTC are specifically associated with the three aspects of dependent variables, this study will focus on exploring the effects of the specific sub-dimensions of WTC, including flextime, break control, leave control, and overtime control.

Another concern may arise that, under some circumstances, employees may work longer overtime when job demands are high. Work time flexibility can be related to the breakdown of work-non-work boundaries. To complete the overload work, employees have to restructure their personal time to work, which may also induce feeling of pressure. Therefore, despite within work time control, employees also reported negative effects of overtime work on their mental health. However, the focus of this study is to investigate the moderating effect of WTC on the relationship between overtime working hours and employees' mental health compared to low or no overtime control.

In addition, this study hopes to fill the research gap in the context of China. A recent systematic review on the association between WTC and health/well-being, work-non-work balance, and job-related outcomes conducted by Nijp et al. (2012), showed that almost all studies were conducted in the US, Europe, or Australia, whereas it is scarce in other

countries. Overall, the aim of this study is to help fill the gaps in the literature and examine whether the previous findings based in Western and European countries can be applied within the distinct cultural context of China and to explore any cross-cultural differences. It hopes to consolidate and enhance the findings in the preceding researches.

This study will investigate to what extent the influence of overtime on employees' mental health, work-family conflict, and job-related outcomes can be moderated by the possible buffering effect of two essential psychosocial work characteristics – namely WTC and rewards – beyond other important individual and work characteristics. Firstly, the present study will focus on the separate dimensions of WTC, including flextime, break control, leave control, and overtime control. Secondly, this study will focus on both overtime compensation and overall rewards at work (by effort-reward imbalance) and employees' preferred type of compensation for overtime work.

Moreover, this study will specifically pay attention to not only the individual influence of WTC and rewards for overtime, but also the combined effect of these two factors, which is extremely limited in previous studies.

Even though overtime is extensively studied with respect to psychological health, work-life balance, and job-related outcomes, further investigation still needs to be conducted. Overtime work is still a controversial issue because of conflicts between these variables. There is still much to be done as we continuously have to learn about the possibility of specific job sources helping to reduce the negative effect of overtime work on employees' mental health, work-life balance, and job-related outcomes.

Therefore, it is urgent that research continues with respect to effective prevention programmes and appropriate reward systems to manage the adverse influence of overtime work on employees as much as possible. This present research conducted two studies in two phases to investigate the

influence of overtime on employees and the potential moderating factors on the influences.

2.4.2 Research Questions & Hypotheses

2.4.2.1 Phase 1 Interviews

The first phase aims to explore Chinese employees' feelings about overtime work and its impact on their lives and their opinion on overtime rewards. Therefore, study one aims to investigate: (1) How do overtime employees feel during/after overtime work; (2) What is the impact of overtime work on employees' life; (3) What is employees' opinion on overtime compensation or rewards. The results of this phase provide interesting insights into the phenomena in question and are also used to inform the next phase of the study.

2.4.2.2 Phase 2 Questionnaire

The purpose of the second phase is to investigate the quantitative relationship between overtime and related outcomes, and the possible effect of specific moderators. The first two of these moderators – namely reward and WTC – were generated from previous studies in this area. The third moderator, however, was generated through the analysis of the data collected in phase one of the current research and is referred to here as involuntary and voluntary overtime. The two major research questions are: (1) whether overtime hours are significantly correlated with mental health, including depression, anxiety, stress, and fatigue; work-family conflict and job-related outcomes, including job satisfaction, turnover intention, and work engagement; (2) whether rewards, WTC, and voluntary overtime could moderate the relationship between overtime and the above variables.

Based on the present findings in the previous studies and study one's results, the following hypotheses are suggested.

Basic Hypothesis:

Overtime is negatively associated with mental health as well as job satisfaction and work engagement, but positively associated with work-family conflict and turnover intention.

Moderation Hypothesis:

(1) Effort-reward imbalance moderates the adverse influence of overtime on employees' mental health as well as job satisfaction, turnover intention, and work engagement.

(2) WTC moderates the adverse influence of overtime on employees' mental health and work-family conflict as well as job satisfaction, turnover intention, and work engagement.

(3) Voluntary overtime moderates the relationship between overtime and mental health and work-family conflict as well as job satisfaction, turnover intention, and work engagement.

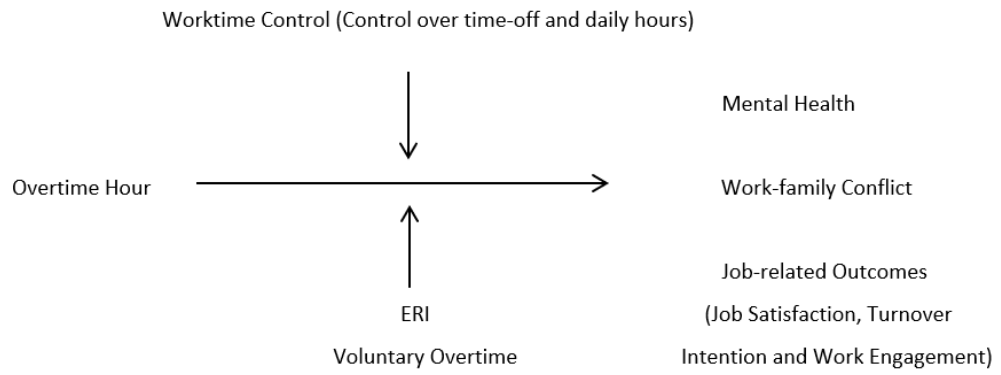


Figure 2.1 Moderation Model of Worktime Control, Rewards and Voluntary Overtime

2.5 Concluding Summary

The literature review presented here has provided an overview of the effects of overtime on employees' mental health, work-family conflict and job

satisfaction, turnover intention, and work engagement. Nevertheless, the influences of overtime are not simple and depend on the extent to which psychosocial resources are available at work. The influences of overtime on personal and job-related outcomes are not always negative. Furthermore, as discussed above, rewards and WTC can be assumed to mitigate the negative influences of overtime according to the theoretically based Effort-Reward Imbalance model and Effort-Recovery Model.

In terms of rewards, previous studies focused on either compensation for overtime or ERI in relation to overtime influences. However, the findings are not consistent. In addition, regarding WTC, even though previous findings have suggested that WTC can be considered as a factor reducing overtime's adverse influence, the precise effects of control over time-off and control over daily hours still lack research and evidence. Furthermore, there is scarce research investigating the interacting effect of rewards and WTC. Moreover, even though a few studies indicated that compared to mandatory overtime, voluntary overtime would induce fewer negative effects, the results are still tentative and empirical studies in this area are lacking.

The inconsistent findings that previous studies offer make it difficult to utilize the outcomes of research to inform policy and practice in real world occupational setting. Therefore, this thesis aims to facilitate consideration of ways to reduce the adverse influences of overtime on employees from the perspectives of rewards, WTC and voluntary overtime. It intends to investigate the individual moderating effect of rewards and WTC as well as the combining and interacting effect of rewards and WTC on overtime – outcomes relationships; investigate the moderating effect of voluntary overtime; and explore the influence of rewards and WTC on voluntary overtime. Additionally, the thesis intends to explore whether results found in western cultural context (individualist culture) can be extended to the eastern cultural context (collectivist culture). The following chapter will describe the details of methodology used in this study.

Chapter 3: Research Methodology

3.1 Introduction

This chapter gives a detailed account of the sequential mixed methods design used in this research, namely qualitative followed by quantitative methods, used to explore employees' experiences of overtime in China's IT industry. This research consisted of two phases: (1) interviews with Chinese employees in a mobile communications company based in China and (2) an online questionnaire, developed from the combination of thematic analysis of the interviews and literature review. The design of the research was determined by the objectives of the research.

3.2 Research Objectives and Research Questions

The objectives for the present research were derived from an extensive review of the literature as outlined in chapter 2. The literature review suggested inconsistent and non-unified findings with respect to overtime impacts and the moderating effect of several factors on the impacts of overtime in previous studies and a particular lack of evidence within the Chinese cultural context. The review of the literature brings together two strands of research: (1) the influence that overtime exerts on employees' mental health, daily life and job-related results; (2) the potential of rewards and worktime control to decrease the negative impacts of overtime. The main purposes of the research are as follows:

1. to investigate employees' experience during or after overtime work and identify the most prevalent mental health complaints associated with overtime; to identify the most common impacts of overtime work on employees' life; and to investigate the effect of overtime on job-related results (by analysis of qualitative interview data);

2. to explore psychosocial factors affecting the impact of overtime on outcomes (by analysis of qualitative interview data);

3. to investigate the influence of psychosocial factors (including reward, worktime control, and voluntary and involuntary overtime) on outcomes related to overtime (by analysis of quantitative questionnaire data);

4. to investigate the moderating effect of psychosocial factors on the relationships between overtime hours and outcomes (by analysis of quantitative questionnaire data);

5. to put forward suggestions to organizations, and policy makers on how to improve employees' mental health, job-related outcomes and decrease work-family conflict associated with overtime work. These may include worktime flexibility improvement, rewarding system amendment or organization-specific changes in overtime work that may improve overtime work conditions.

The research questions addressed in the current research are as follows:

1. What are predominant impacts of overtime on employees' mental health, life and job-related outcomes in the Chinese IT industry? (Qualitative)

2. What factors are affecting the outcomes of overtime in the Chinese IT industry? (Qualitative)

3. How reward, worktime control and involuntary and voluntary overtime affect these outcomes? (Quantitative)

4. What are the relationships between reward, worktime control and involuntary and voluntary overtime? (Quantitative)

The literature review showed that overtime has achieved highly attention in the occupational area. Previous studies have deeply explored the impact of overtime in various associated aspects. Recently, the focus of studies is moving towards exploring factors potentially helping to modify overtime conditions to reduce negative impacts. Nevertheless, studies based in the Western (individualistic) cultural context, investigating the influence of possible moderators on overtime's adverse outcomes are still deficient and the findings are not consistent. Moreover, relevant studies are especially lacking in the Chinese (collectivistic) context. Therefore, this study was implemented among Chinese employees based in the Chinese cultural context.

According to the literature, overtime may cause various adverse mental and physical reactions during or after overtime work, such as psychological distress, anxiety, depression, fatigue and sleep disturbances (Ala-Mursula, 2006; Beckers et al., 2004; Kleppa et al., 2008; Virtanen et al., 2012). Overtime work is not only related to physical and mental health problems, but also has a negative effect on employees' life. Employees working overtime have less time for family responsibilities, their hobbies, leisure time and other meaningful activities in life (Bohle et al., 2004; Geurts et al., 2009). In addition to personal outcomes, job-related outcomes associated with overtime vary depending on overtime work conditions.

Moreover, existing models related to overtime have highlighted various critical factors affecting the extent overtime can exert adverse influences. The work-related factors that are posited to affect the impacts of overtime have been captured in the effort-reward imbalance (ERI) model and job demands-resources (JD-R) model, which are adopted in this research and explained in Chapter 2 of this thesis. Whist these two models appear to offer a robust theoretical foundation of the moderating effect of reward and worktime control on overtime influences, much more research is needed to investigate them across different cultures and among different occupations.

As such, the present research seeks to explore factors moderating the impacts of overtime in the Chinese IT industry that is based in the collectivist context and an industry where overtime is prevalent.

The following sections of this chapter present in more detail the methodology for the current research. The chapter starts by explaining the full mixed methods research design and its qualitative and quantitative elements. Subsequently, the chapter continues by presenting the general data sources and data analysis strategies for the qualitative and quantitative methods used. Finally, it considers the ethical issues involved in this research and how they were dealt with during the research process.

3.3 Research Design

3.3.1 Mixed Methods Research

This research employed a sequential mixed methods approach whereby qualitative data were collected from semi-structured interviews and quantitative data were collected from an online questionnaire survey. The qualitative study explored the experience of the phenomenon of overtime in the Chinese IT industry and the potential factors affecting the impacts of overtime while the quantitative study assessed the influence of these factors on outcomes identified in the qualitative study. The quantitative study was based on the combined literature review and qualitative findings. The overall research is therefore conducted using mixed methods as a general methodological approach.

Mixed methods can be defined as “research in which the investigator collects and analyses data, integrates the findings and draws inferences using both qualitative and quantitative approaches or methods in a single study” (Tashakkori & Creswell, 2007, p. 4). In mixed methods research, both qualitative and quantitative studies involve collecting, analyzing,

interpreting and investigating the same phenomenon (Bryman & Bell, 2015; Onwuegbuzie & Leech, 2006). The mixed methods approach mixes or integrates the findings at some point in the research process (Johnson & Onwuegbuzie, 2004). Mixed methods are considered as a productive way to collect a variety of data in a research design compromising multiple viewpoints, perspectives and positions (Greene, Benjamin, & Goodyear, 2001).

There are a variety of reasons for using a mixed methods approach that have been identified in the previous studies (Collins, Onwuegbuzie, & Sutton, 2006; Greene et al., 2001; Jick, 1979; Leech, Dellinger, Brannagan, & Tanaka, 2010). From a comprehensive perspective, Doyle, Brady, and Byrne (2009) summarized the following eight major reasons of conducting mixed methods research: triangulation, completeness, offsetting weakness, answering different research questions, explanation of findings, illustration of data, hypotheses development and testing, and instrument development and testing. Similarly, Greene, Caracelli, and Graham (1989) inductively identified five major purposes or rationales of mixed methods approaches: triangulation, complementarity, development, initiation and expansion.

Calls for the integration of qualitative and quantitative studies emphasizing the advantages of the mixed methods approach have been widely carried out in the management and organizational field (Aguinis et al., 2010; Bazeley, 2008; Currall & Towler, 2003; Daft & Lewin, 1990; Edmondson & McManus, 2007; Lee, 1991). This approach has plausible advantages in considering and analyzing different dimensions of a phenomenon that has showed an increasing level of acceptance and impact in business and management related fields and practical implications for the organization (Azorín & Cameron, 2010; Hurmerinta-Peltomäki & Nummela, 2006; Molina-Azorin, 2012) and recommendations and development for future research (Bamberger, 2000).

This approach was desirable considering the unexplored nature of overtime, a comprehensive understanding of the phenomenon of overtime in the IT industry in China and the applied empirical focus of the research. Regarding the relationships between the qualitative and quantitative studies, they are linked not only in their focus on the phenomenon of overtime but also in the complementarity of their designs and results. The design and results of the qualitative study were inputs for the enrichment of the quantitative study and the quantitative study provided further evidence, and complementary insights. The qualitative and quantitative studies focused on different research objectives, although they were linked within the overall purpose of this research.

3.3.2 The Qualitative – Quantitative Duality and Mixed Methods

The methodology paradigm for social research usually focuses on consideration of four issues, namely philosophical assumptions and stances, methods of inquiry, guidelines for practice and sociopolitical commitments (Greene, 2006). Traditionally, the two main paradigms, qualitative and quantitative, have been dominant on different domains of these arguments.

According to Creswell (2014), regarding the qualitative method, researchers usually make claims based primarily on constructivist and interpretivist perspectives. There is no simple reality but several that are socially constructed and based on the combination of the object of the research and the experiences of the investigator. Additionally, in the process of undertaking the research, the researcher and the participants involved in the research are interactively linked and influenced (Sale, Lohfeld, & Brazil, 2002). A researcher usually conducts qualitative research to collect open-ended data within the intention of either identifying themes from the results of data analysis or developing themes from it (Berg, Lune, & Lune, 2004). Thematic analysis, grounded theory, narrative analysis and phenomenology are common data analysis techniques within the qualitative approach (Merriam, 2002).

By contrast, “a quantitative approach is one in which the investigator primarily uses postpositivist claims for developing knowledge (i.e., cause and effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, and the test of theories)” (Creswell, 2003, p. 18). Quantitative researchers contend that social observations should be treated as entities and the observer is separate from the entities and objective to the social science inquiry which can generate reliable and valid scientific results (Johnson & Onwuegbuzie, 2004). The quantitative researcher intends to investigate the relationships between variables by collecting objective numeric data. The phenomenon is not under the investigator’s control and influence (Krippendorff, 2008).

Considering the qualitative-quantitative duality, the development and prospect of mixed methods theory combining distinct approaches and frameworks remains a big challenge (Greene, 2008). The debate about the mixed methods paradigm is mainly surrounding the superiority of one approach compared to the other and the incompatibility of both techniques with respect to their epistemological and ontological assumptions (Azorín & Cameron, 2010). Despite these concerns, the mixed methods approach has been increasingly used and recognized as the third major research paradigm along with qualitative research and quantitative research (Johnson, Onwuegbuzie, & Turner, 2007). The qualitative approach and quantitative approach can be combined in a study with the complementary purpose of understanding phenomena comprehensively considering different aspects (Johnson & Onwuegbuzie, 2004).

The mixed methods approach has been considered as the third methodological movement, a separate methodology that is distinct from qualitative and quantitative approaches (Tashakkori & Teddlie, 2010). Johnson et al. (2007) indicate that considering the practical orientation of mixed methods, its central philosophy is rooted in pragmatism rather than

positivism, constructivism or interpretivism. In order to illustrate the position of mixed methods as a third paradigm, they suggest the following qualitative – quantitative continuum as presented in Figure 3.1.

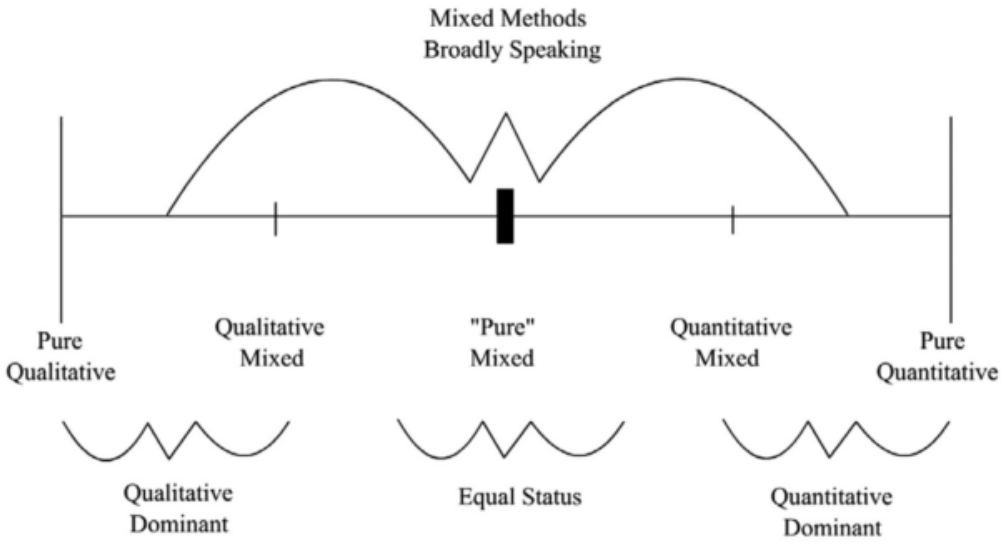


Figure 3.1 Qualitative – quantitative continuum. Source: Johnson et al. (2007 p. 124)

The continuum as presented in Figure 3.1 shows that the mixed methods approach integrates the overlapping portions of qualitative and quantitative combinations. By moving in this continuum, the research can be dominated by either a qualitative or quantitative perspective whereas it is still mixed methods. To illustrate this obviously, qualitative researchers may incorporate quantitative methods in their qualitative study (qualitative dominant), or vice versa (quantitative dominant). As long as a research combines qualitative and quantitative methods to any degree, the research can be no longer considered as a single method design (Creswell & Creswell, 2017; Johnson & Onwuegbuzie, 2004).

Figure 3.1 further shows that the central area of the continuum is a pure mixed methods design, indicating this does not have a dominant approach,

instead both qualitative and quantitative approaches are equally important. In this thesis, the approach was a quantitative dominant mixed methods approach. Qualitative and quantitative investigations and findings complement each other aiming at building an integrative picture of overtime and comprehensive understanding of impacts of overtime on employees in the Chinese IT industry as well as the role of potential factors affecting these impacts. The design implications of this perspective are discussed in the next section.

3.3.3 Building a Mixed Methods Design

In order to implement a mixed methods design, a researcher needs to thoroughly think through the decisions underlying the conceptualisation, design, implementation, analysis and reporting of research, which may affect the mixed methods design at each stage (Johnson & Onwuegbuzie, 2004). The basis of the functions of these decisions are the level of mixing (partially mixed versus fully mixed), time orientation (concurrent versus sequential), and emphasis of dominance of approaches (Leech & Onwuegbuzie, 2009). Making these decisions should be according to each stage of the research.

At the data collection stage, Onwuegbuzie and Collins (2007) propose two criteria to undertake a mixed methods design, namely time orientation and association between qualitative and quantitative samples, which are considered as key elements in the decision making process. Time orientation refers to the moment in time when the qualitative and quantitative phase occurs. The qualitative and quantitative phase can occur concurrently (at the same point in time) or sequentially (on after the other). There are a number of different types of mixed method designs. Robinson (2002) states that research approaches can be mixed in different ways to investigate the subject and achieve the research targets. Qualitative research can be further added after a quantitative questionnaire to deeply explain its results; alternatively, qualitative research can be employed at

the start of the research to explore the relevant issues and suggest the main topics before the findings are investigated statistically in a large sample using a questionnaire design.

In terms of the relationship of the qualitative and quantitative samples, Onwuegbuzie and Collins (2007) indicate that it refers to the origin of data and identify four types of relationships to illustrate this point. These are identical relationship (same sample members participate in both phases), parallel relationship (heterogeneous samples from the same population), nested relationship (sample members in one study are a subset of those participating in another), and multilevel relationship (two or more sets of samples from different levels).

Consequently, this present research follows a sequential time orientation and parallel relationship. The sequential time orientation indicates that the data collection for the qualitative study was undertaken before the quantitative study. A sequential orientation is justified as the qualitative study did not only have the purpose of understanding the phenomenon of overtime, but also identifying the predominant impacts of overtime on employees with respect to mental health, life and job-related outcomes and potential influential factors relating to overtime impacts. The results of the qualitative phase further provided information for the development of the online questionnaire survey. As such, the qualitative study was conducted first to provide contextual understanding along with uncovering expansive relationships among research variables to be tested empirically in a large-scale survey.

In addition, two studies used different data sources in a parallel sample relationship. In line with the parallel framework, this thesis included two sets of study samples from the same population. The qualitative study was based on semi-structured interviews with employees who had overtime experience in a Chinese mobile communications company. The quantitative study was

based on an online questionnaire survey with a large sample from the same population.

Time orientation and the methods relationship criteria are related to and depend on the purpose of the research (Greene et al., 2001). There are two major parts of reasons for using a mixed methods approach in this study: one is for theoretical reasons which are generally applied across the research design; the other is to best tailor the approach to the specific aims and features of the current research.

There are various reasons why researchers may choose to combine qualitative and quantitative approaches in mental health research in terms of (a) convergence, either triangulation, using one type of data to validate results from other type of data, or transformation, the sequential quantification of qualitative data or using qualitative technique to further understand the findings from quantitative study; (b) complementarity, using different methods for the purpose of evaluation, quantitative approach for evaluation of outcomes and qualitative approach for process, or elaboration, qualitative method for depth of understanding and quantitative method for breadth of understanding; (c) expansion, using qualitative method to explain findings from quantitative study; (d) development, using qualitative method to identify the content of items to be investigated in a following quantitative study; and (e) sampling, using one method to select a sample for the other method (Palinkas, Horwitz, Chamberlain, Hurlburt, & Landsverk, 2011).

For this thesis, transformation, elaboration and development were reasons for using mixed-methods to explore overtime influences and potential psychosocial characteristics in relation to these outcomes. The qualitative study provided a deep and detailed understanding of overtime work and identified major mental health problems, WFC and several job-related outcomes as well as three moderators related to these influences and

guided the quantitative study to further broadly examine their relationships in terms of its applicability to a wider group.

There are a number of reasons for employing a mixed method approach, which relies on using a number of different research approaches (Creswell, Plano Clark, Gutmann, & Hanson, 2003). Inherently, a mixed method design enables the researcher to combine the advantages of different approaches together in a study. For instance, it enables the researcher to learn more about the subjects being studied. Qualitative methods can be used to improve researchers' understanding of the phenomenon that is important to the topic being studied, to develop assessment strategies, and to develop and design specific measuring scales in the questionnaire. Quantitative methods can be used to further test hypotheses or findings obtained from the qualitative data study (Sandelowski, 2000).

Additionally, the disadvantages of a singular approach are avoided to a large extent. A mixed methods approach can uncover some aspects that are unique to one approach but are neglected or ignored by other methods. Qualitative measures supply detailed and in-depth information and explanation for the study and quantitative measures enables statistical analyses between variables to be conducted and maximizes the generalizability of the study results. The qualitative approach offsets the quantitative method's briefness while the quantitative approach's objectivity offsets the qualitative approach's subjectivity (Brewer & Hunter, 1989).

Specifically, one major advantage of employing a mixed methods approach is the matter of triangulation – knowledge on the group being studied can be improved and the results from one approach can be checked via another approach in a study investigating the same subject (Robinson, 2002). Creswell et al. (2003) claim that the validation from the mixed methods approach highly enhances the study's reliability and validity. This

methodological pluralism is considered to largely decrease the possibility of subject-experiment artefacts and single-method variance (Cooper & Bosco, 1999). In general, mixed methods can produce more productive, in-depth and valid data for the purpose of a research study.

The choice of this study's mixed method design was driven by the purpose of the research. This research aims were to investigate the effect of worktime control and rewards on the relationship between overtime and IT employees' mental health, life and related job outcomes. However, at first, it was essential to determine specific aspects in the Chinese IT industry regarding the outcome variables mentioned above. Therefore, this research employed a sequential mixed methods design. A qualitative study was implemented at the first stage to widely explore the influence of overtime on related respects and potential work-related factors affecting the influence of overtime. Furthermore, on the basis of qualitative data analysis, the follow-up quantitative study was informed and designed to statistically investigate the relationship between overtime, moderators and predominant aspects regarding the three categories of outcome variables. An overview of the current research methodology is given below. Figure 3.2 displays this current research methodological process based on Creswell et al. (2003) sequential exploratory design.

Phase 1: Qualitative pilot interviews (n=2) and formal interviews (n=13)

Phase one aimed to explore employees' experiences of overtime and effects of overtime on employees working in the Chinese IT industry, and to explore employees' opinions on rewards as well as overtime on the whole. In phase one, the semi-structured interview questions were developed based on the literature review about the impact of overtime (Nijp et al., 2012) as well as rewards at work and compensation for overtime work. In the next stage, the interview questions were piloted in two interviews with two employees, a female and a male, who were

full-time employed and had overtime experience in the previous six months. The interview questions were refined prior to the formal interviewing process. Thirteen Chinese overtime employees in the IT industry were involved, discarding the data from two pilot interviews, which focused around an explorative epistemological standpoint, in reflection of the impact of overtime from different respects, employees' attitudes towards rewards and employees' opinions on overtime overall.

Phase 2: Large scale quantitative questionnaire study (n=265)

The second stage of the sequential mixed methods design sought to statistically investigate the effect of rewards, worktime control, voluntary and involuntary overtime on employees' mental health, family and job-related outcomes and on the associations between overtime hours and outcome variables by implementing a large-scale quantitative questionnaire (n=265). The measuring scales were designed based on the thematic analysis of data from phase one qualitative interviews, in conjunction with the literature review. Different measuring scales were designed in a questionnaire assessing specific variables in this research. A total of 265 participants completed online questionnaires involving 144 males and 121 females (response rate of 22.3 percent) from which the data were statistically analysed using SPSS for Mac version 24. The questionnaire included the following sections:

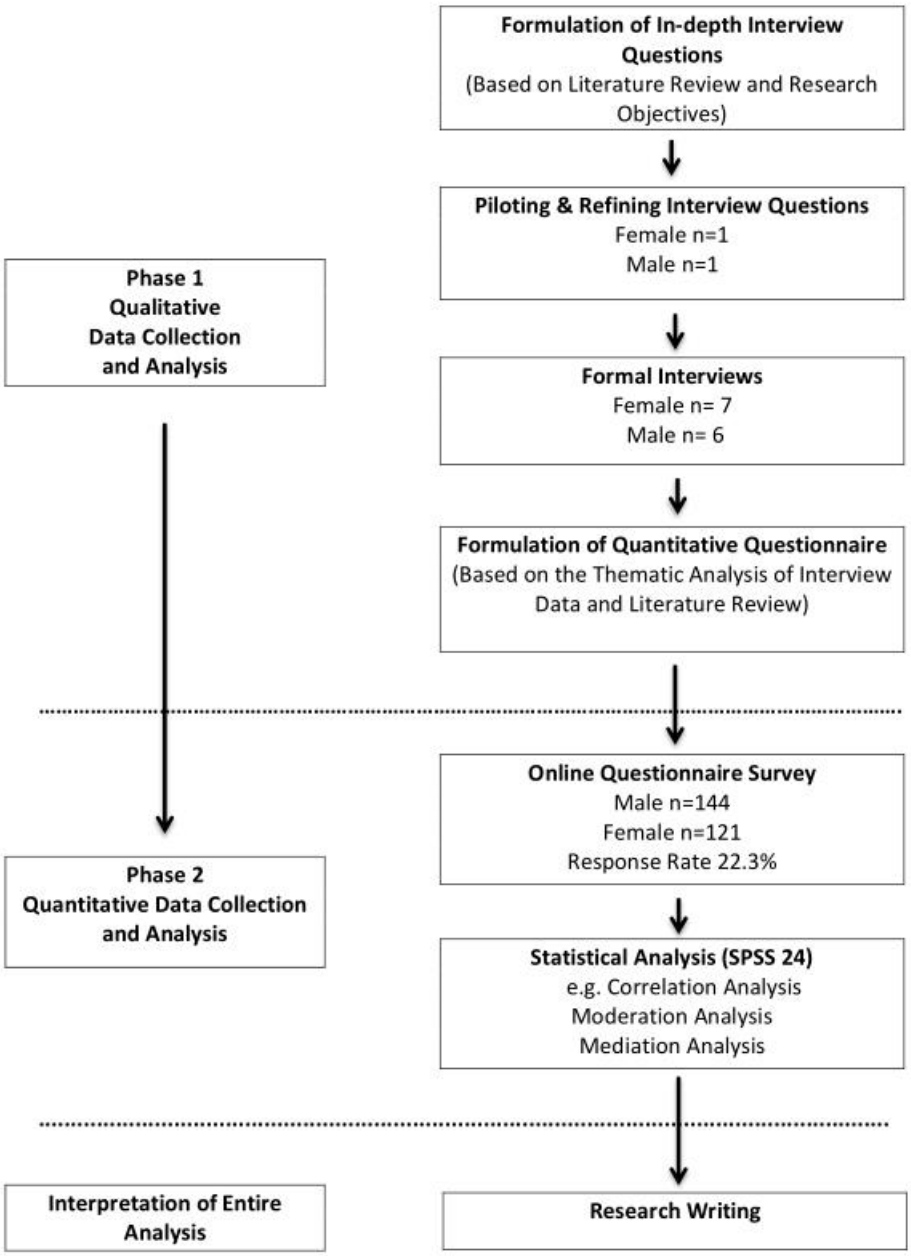
1. Biographical Details — personal demographic information
2. Overtime Information — overtime intensity (including overtime hours per week and overtime days per month) and overtime schedule control
3. Rewards — rewards for overtime work and effort-reward imbalance at work
4. Worktime Control — control over daily hours and control over time-off
5. Psychosocial Overtime Work Factors — voluntary or involuntary overtime reasons

6. Psychological Health — DASS-21 (depression, anxiety and stress), fatigue and recovery

7. Work-family Conflict — work interferences with family

8. Job-related outcomes — job satisfaction, turnover intention and work engagement

Figure 3.2 Research Methodological Process



3.3.4 Quality Criteria for Mixed Methods

The accuracy and quality of inferences draw from mixed methods research should be evaluated and judged according to the extent to which the research incorporates and represents qualitative and quantitative paradigms. Taking

this perspective into account, the traditional criteria are the reliability and validity of results draw from both approaches (Creswell, 2014). Regarding the quantitative approach, statistical terms are used to investigate reliability and validity (Golafshani, 2003). However, under the qualitative approach, conceptual clarity and rigor are conceptualized to assess reliability and validity, which implies implementing verification techniques in accordance with the philosophical perspectives inherent in the qualitative method, including methodological coherence, sample appropriateness, concurrent data analysis, and theory integration and development (Leung, 2015; Morse, Barrett, Mayan, Olson, & Spiers, 2002).

In general, Bryman, Becker, and Sempik (2008) proposed that three criteria were considered as relevant and appropriate for a mixed methods design. Firstly, the implementation of a mixed methods design should be pertinent to the research question. Secondly, the procedures employed in conducting mixed methods research should be transparent. Finally, findings drawn from mixed methods research should be combined but not viewed as separate qualitative and quantitative findings. However, these elements cannot replace the traditional reliability and validity criteria within qualitative and quantitative approaches (Greene, 2008). Conversely, they could be considered as general criteria to judge the overall integration of methods.

Consequently, in this thesis the quality criteria for the qualitative approach implemented in the qualitative study referred to member checking (Thomas & Magilvy, 2011), prolonged engagement (Lincoln & Guba, 1985), independent coding and researcher validation (Merrick, 1999), and sample appropriateness (Fusch & Ness, 2015). Similarly, reliability and validity judgments including power analysis and internal consistency (Cronbach's alpha) were employed in quantitative study. In addition, other specific quality criteria were further evaluated according to each study's data sources, which will be discussed in the next section.

3.4 Data Sources

The following sections discuss the data sources included in each study as well as their strengths and limitations with respect to this thesis.

3.4.1 Qualitative Data Sources

The qualitative study (Chapter 4) involves only one source: semi-structured interviews. This kind of interviews are non-standardized and are frequently employees in qualitative research as they enable the interviewer to ask open-ended questions based on the interview guide but also have the flexibility to adjust the order of questions according to the direction of the interview. The interviewer can also ask additional questions to prompt significant views and opinions that have been considered initially and probe deeper into the responses (Fusch & Ness, 2015; Kajornboon, 2004).

The current qualitative study focuses on the analysis of the predominant impacts of overtime on employees in the Chinese IT industry relating to mental health, daily life and job-related outcomes as well as the exploration of potential factors moderating the impacts and thirteen semi-structured interviews were conducted. Face-to-face interviews are considered as the dominant technique in the area of qualitative research. However, due to the increase of new communication forms, other techniques are becoming more and more common, such as telephone interviews, video conference, and e-mail or electronic/online interviews (Carr & Worth, 2001; Hunt & McHale, 2007; Sears, Zhang, Wiesner, Hackett, & Yuan, 2013; Opdenakker, 2006).

In this present research, electronic (online conference) semi-structured interviews were implemented. This kind of interview has advantageous benefits for this research. The video-based instrument has synchronous communication of time and asynchronous communication of place (Opdenakker, 2006). This is beneficial for the researcher who is a full-time

student studying in Nottingham, United Kingdom whereas the interviewees were based in China. The online conference interviews can also offer the interviewer opportunities to gain first-hand information that provides insight into the personal experiences of interviewees (Schultze & Avital, 2011).

Within online conference interviews, the interviewer can not only capture verbal cues, personal dispositions and mannerisms like face-to-face interviews, but also can create rapport relationships with the interviewee. Furthermore, the online interviewing process may be less stressful and more convenient for interviewees as they can choose the place where the interview is undertaken that they feel safe and unthreatened (Gruber, Szmigin, Reppel, & Voss, 2008). Similarly, Hanna, Weinberg, Dant, and Berger (2005) indicated that interviewees are more likely to express their true feelings in an online environment than during traditional face-to-face interviews.

Furthermore, semi-structured interviews is considered as a useful means of exploring people's experiences, attitudes, values and opinions (Rowley, 2012). This present qualitative study is particularly interested in the experiences of Chinese IT employees in relation to overtime impacts. In particular, semi-structured interviews may be a most useful technique to investigate the subject matter in which situations the people have been under-researched (Rowley, 2012). In terms of this current research, although previous studies have extensively explored the impacts of overtime, not much research has been conducted in collectivistic countries like China and in particular, the IT industry. Semi-structured interviews provide the interviewer opportunity to flexibly enough explore issues generated from interviewees' responses (Doody & Noonan, 2013).

There are some limitations and challenges with semi-structured interviews that should be considered in the aspects of design, implementation and analyses of qualitative studies. Cassell and Symon (2004) propose that four aspects deserve to be considered. Firstly, the process of interviews is highly

time-consuming for the interviewer, including developing an interview guide, conducting interview and analyzing the transcripts. Secondly, interviews are also energy-consuming as the interviewer needs to put substantial concentration into the interviews. Thirdly, interviews are also time-consuming for interviewees. Finally, interviews can produce a large number of audio recordings inducing data overloading and complex analysis.

Additionally, the responses generated from the interviews may be inaccurate and the interviewer may be unable to validate every single information as this may raise ethical issues and may be impractical or impossible. However, Rubin and Rubin (2011) claim that if the interviewer can establish intimate relationships with the interviewee and let the interviewee feel safe and at ease, it is more likely to get more accurate information. King and Horrocks (2010) indicate that in the constructivist perspective, reality or knowledge "at different times and places there will be different and often contradictory interpretations of the same phenomena" (p. 22).

Furthermore, regarding electronic interviews, Morgan and Symon (2004) argue that although these forms of interview are neither better nor worse than other interview techniques, the researcher should take some potential limitations into consideration. The dominant concern regarding electronic interviews is related to reliability and validity. They claim that the information may be not reliable due to the distant and de-contextualised relationship. Despite these concerns, these limitations are not considered essential as video conference interviews can also get visual cues in comparison with telephone interviews or email interviews. Additionally, the purpose of this study was identifying the impacts of overtime which are of relevance for context like personality or sensitive issues.

An essential role for a researcher is to increase the quality of the interview data and the validity of the interview process. The key point to achieve these purposes is associated with the interview guide and the skills of the

interviewer. Developing an appropriate interview guide is beneficial to achieve a comfortable interaction with interviewees and to generate data-driven conclusions (Dilley, 2000). To achieve this, much effort is needed to study background information in terms of previous literature and theoretical foundations as well as the population to be interviewed. Consequently, to collect interview data relevant for the research aims, it is essential for the researcher to develop as much expertise in relevant topic areas as possible in order to be able to ask informed and relevant questions (Qu & Dumay, 2011).

The interview guide employed in the current qualitative study follows these suggestions for quality purposes, which was developed after extensive work with the literature review and existing models associated with potential factors moderating the impacts of overtime. The details of its development, the interviewees and the process of recruiting participants are presented in Chapter 4.

3.4.2 Quantitative Data Sources

The quantitative phase was based on an online survey designed for the purpose of this thesis. The survey examined the impact of overtime on mental health, work-family conflict and several job-related outcomes and the moderating effect of reward, worktime control and voluntary or involuntary overtime, on the overtime – outcomes relationships in the Chinese IT industry. The questionnaire was composed of items from standardized and well-established scales for measuring various variables in this study. The survey scales are described in detail in Chapter 5 and presented in Appendix A. The typical characteristics and arguments for choosing this method are explained in the next section.

The online survey was targeted at employees who had overtime experiences in the previous six months in the Chinese IT industry. A total of 1188

employees and managers were invited to take part in the survey with 265 (22.3% response rate) fully completing the questionnaire via the online survey link. The strategy of the distribution of the survey employed in this study was guided by Sheehan (2002). The author proposes three main ways to electronically distribute online questionnaires including: sending respondents the entire questionnaire in an email message; sending respondents an invitation email within a participant information sheet and a hyperlink to the online survey; and placing a request for respondents on a webpage. Regarding the present study, the link to the survey (https://www.wjx.cn) designed for this research project was available on the Wen Juan Xing platform. Emails were sent by the researcher to individual employees in the China Mobile Taiyuan Branch who were presented the requirements of participation and redirected to the online survey platform.

Previous studies have largely documented benefits and limitations of online-based surveys in comparison with other survey forms such as paper-based, and face-to-face surveys (e.g. Couper, 2000; Duffy, Smith, Terhanian, & Bremer, 2005; Ilieva, Baron, & Healey, 2002; Kaplowitz, Hadlock, & Levine, 2004; Tenforde, Sainani, & Fredericson, 2010; Van Selm & Jankowski, 2006). A main advantage of online surveys is that they are easy and convenient to achieve a relatively large number of potential participants. They can also provide an opportunity for multiple question formats, direct database connectivity, and usually guarantee the confidentiality and anonymity of responses.

Taking these merits into consideration, this thesis particularly follows the relevant recommendations from Evans and Mathur (2005). They proposed that online surveys are especially suitable when wide geographic coverage is required; a large sample size is needed; access to a good potential participant list is enabled; multiple samples need to be surveyed; and interaction between the researcher and respondents is not necessary. In the current study, the targeted participants were employees who had worked overtime in

the previous six months across all working levels in the Chinese IT industry. The online survey provided the opportunity for those who met the requirements to participate and excluded those who did not, which was beneficial in terms of timesaving and avoiding resource wasting.

However, in terms of implementation, online surveys have several challenges. One main limitation is that online surveys may induce sampling bias as the researcher lacks control over sample selection (Van Selm & Jankowski, 2006). Participants select themselves based on the specific criteria stated in the survey instructions that are created by the researcher. In the present study, at the beginning of the online questionnaire, the criteria were clearly stated. The targeted sample was full-time employees who had overtime experience in the previous six months. Therefore, only participants who met these criteria could move to the next page to continue completing the following survey whereas the online survey was terminated if participants did not meet the set criteria.

Another two concerns of online surveys are low response rate and representativeness caused by coverage and sampling error (Sheehan, 2002). The internet is essential for this survey. In order to get random samples from the population, participants can complete the survey through various instruments, such as phone, iPad and laptop. The online medium may not be an issue in terms of access to potential participants as in the current information age, mobile data and Wi-Fi are widely covered. However, calculating sampling error is also a challenge as probability sampling techniques are often not suitable for online surveys (Couper, 2000). Therefore, non-probability sampling techniques were used in the current study.

Regarding the response rate, according to Handwerk, Carson, and Blackwell (2000), response rates of online surveys are usually lower compared to paper versions. However, a number of strategies can be implemented to increase response rates of online surveys according to suggestions from previous empirical studies, such as the number of contacts or reminders, personalised

correspondence and pre-contacts (Cook, Heath, & Thompson, 2000; Joinson & Reips, 2007; Saleh & Bista, 2017; Sánchez-Fernández, Muñoz-Leiva, & Montoro-Ríos, 2012). In this current study, in order to improve the response rate, the participants could set up a username and password so that they could return back to complete the survey for their convenience; a reminder email was sent; and an automatic monetary compensation was rewarded after completing the online survey.

In order to improve the quality criteria, clarity and easy access help to reduce the limitations of online surveys (Andrews, Nonnecke, & Preece, 2003; Evans & Mathur, 2005; Shannon, Johnson, Searcy, & Lott, 2002). This current survey was designed as concisely as possible with short instructions and clear format. Surveys were tested with different instruments and various browsers (Explorer, Safari and Firebox). In order to ensure privacy and confidentiality, a secure online platform was employed.

3.5 Ethical Considerations

After presenting the methodological design in this thesis, ethical issues should also be considered. The current research follows ethical principles according to the British Psychological Society's Code of Ethics and Conduct (2009), Code of Human Research Ethics (2010), Ethics Guidelines for Internet-mediated Research (2013), and the Data Protection Act (2018). This research was granted ethical approval by the Faculty of Medicine & Health Sciences Research Ethics Committee of the University of Nottingham, UK. Taking these guidelines into consideration, this thesis acknowledges and complies with the general standards for ethics such as informed consent, anonymity, confidentiality, data protection and transparency. Additionally, this thesis also considers specific ethical issues regarding individual studies. These are detailed in the following sections.

Two critical issues, namely anonymity and confidentiality, should be given attention. During the whole process of this research, including participant recruitment, interviews and online questionnaire survey, participants were assured of anonymity and confidentiality. Since the study utilized an employee sample, there was a possibility that participants would be concerned about the use of the information they provide and whether it could be adversely used against them. This could affect whether they respond truthfully to the research questions. To guard against that phenomenon, the researcher assured employees that their participation would be entirely anonymous, and all their responses would be confidential. Furthermore, respondents would not be identified. For interviews, the audio recordings were immediately deleted after transcribing.

Confidentiality was an important issue that was ensured throughout this research. Data was protected in a safe place, accessed only by the researcher. In accordance with the data protection policy of the University of Nottingham, the data will be kept on an encrypted database for seven years after which it will be securely disposed of. What should be highlighted is that the protection of privacy was adhered to across the whole research stages, not only when collecting the data but also when reporting findings after analysing the data. It was extremely important that the data would be interpreted accurately. Falsification of data, which means changing the true findings for catering to the hypotheses, is forbidden firmly. In addition, when reporting and disseminating the research findings, the researcher ensured that use of language was as appropriate and precise as possible, avoiding biased language or discrimination (Sarantakos, 2005).

The materials of participant information and consent form were used in this research for semi-structured interviews and the quantitative online surveys.

Participant Information (Phases 1 & 2)

A 'Participant Information' Sheet (see Appendix 6) was separately attached in the email invitation sent to potential participants during phase 1 and phase 2. These two forms detailed the overall purpose of the study and related ethical issues. Specifically, the two forms briefly outlined the project, the requirements for potential participants and the tasks for participants. Additionally, they also explained the potential benefits for participants, how the information provided by participants would be used and the potential influence the study might have on them, by which it aimed to reassure participants in order to take part in the study. In this current study, participation was totally voluntary. There was no adverse impact on participants who did not wish to take part.

Consent Form

a. Interview Consent Form

An 'Interview Consent Form' (see Appendix 7, Phase 1) was used to gain participants' informed consent prior to formal interviews. This form listed the requirements and rights for participants who would be involved in the interview. The interview would be tape-recorded, and participants were free to withdraw from the study at any time without giving a reason. The audio recordings would be deleted after the transcription was completed. However, participants were also informed that it may not be technically possible to withdraw their data unless requested within one week after the interview and once data analysis began, the data could not be withdrawn. Additionally, permission to tape-record the interviews was sought from the participants.

b. Questionnaire Consent Form

A 'Questionnaire Consent Form' (see Appendix 7, Phase 2) was presented at the beginning of the online questionnaire. This form informed participants that their participation was entirely voluntary, and they could give up at any time during answering the questionnaire. After participants clicked the next

button to answer the survey questions, this indicated their consent. Participants were informed that for anonymous questionnaire studies, once they had completed the study and submitted their questionnaire, the data could not be withdrawn. They were also informed that their unidentifiable data would be used in academic research reports or publications. Finally, participants were informed that the main results or at least a summary of the study would be provided to them if they wished to be kept informed of the study findings.

In terms of interviews, rapport building is an important element to guarantee a good start, smooth conduct and effective interview responses. At the beginning of the interview, the researcher should make the interviewee feel as comfortable as possible and gain their trust (Jacob & Furgerson, 2012). In order to avoid monosyllabism in the interview, the researcher gave a clear interview time approximately required and emphasized the anonymity of all answers at the beginning. Subsequently, the first question is open and brief. With respect to dealing with situations when the participant was still extremely laconic despite the above precautions, the researcher sometimes kept silence as Cassell and Symon (2004) claimed that silence may be more effective than movement onto the next question, which may convey the implication that you would like him/her to talk more about this question rather than always repeating 'please tell me more' which may annoy the interviewee. At the same time, the researcher was cautious of interviewees not feeling being pressured. In contrast, some interviewees indulged in prolix digressions, which were paused or interrupted as naturally and subtly as possible.

Additionally, regarding ethical issues around compensation for participants in questionnaire survey, there are some reasons for compensation and some concerns. Compensation may be a sign of respect and a way to facilitate participation (e.g. Bentley & Thacker, 2004; Halpern, Karlawish, Casarett, Berlin, & Asch, 2004). Small amounts of money may increase response rates

(e.g. Asch, Christakis, & Ubel, 1998; Ulrich et al., 2005). A major concern about payment is coercion or undue inducement. However, US Code of Federal Regulations indicated informed consent be obtained that minimize the possibility of coercion or undue influence. Coercion is a threat of physical, psychological, or social harm in order to compel someone to do something, whereas monetary compensation is an offer or an opportunity, and not a threat of harm. In the current study, participants can refuse to participate who were not identified and without any negative influences. Small compensation in this study is not strong enough to compel participants to participate against their willingness and interests. Therefore, undue influence (inducement) is avoided to a large extent. Small compensation rather than undue inducement is appropriate is an approved study (Emanuel, 2004).

3.6 Reflections about Implementation

Operationalising both the qualitative in-depth interviews and the quantitative questionnaire survey was perhaps a challenging process in this research. During the interviews, the researcher had to give an appropriate response when interviewees talked about negative experiences and feelings about overtime. Even though the topic of overtime is not a particularly sensitive issue, the exploration of overtime impacts on aspects involving mental health and life that may cause participants' negative emotions and feelings. Participants were sometimes reluctant to express their feelings at the beginning of the interview. When encountering this situation, the researcher used various ways to assure the participants and let them feel at ease to share their experiences; for example, the researcher put forward some prompts to encourage participants. Whilst every effort was made to ensure that questions and prompts were not "leading" in any way, it cannot be said for certain that these had a neutral effect on participants and consideration should be given to the possibility that participants responses were shaped in some way by the researchers interventions.

The issue of mistrust that participants may hold towards the researcher also needs to be considered. Hinkin and Holtom (2009) have identified trust in the researcher as an important contextual factor that may affect the participant's willingness to take part in a survey. This current research was conducted by the researcher as someone external to the organization, in which situation, the participants may have felt more at ease than if they were surveyed by their own organization. Additionally, as mentioned earlier, the researcher emphasized anonymity and confidentiality to further assure the participants to provide reliable responses and lessen their concern about potential adverse impact of their participation in the study.

Conversely, overtime workers who experienced frequent and high intensity overtime work, compulsory overtime and unequal compensation for extra effort, seemed to have more complaints, which had the potential dominate the course of the interview. For example, some interviewees who experienced continuous and long overtime work but did not receive any compensation for their extra investment kept expressing their discontent. Conversations that started to veer off-topic for too long were interrupted and redirected to the next question politely. Even with further probing and subtle prompting, several interviewees still focused on catharsis although they mentioned that they have some worktime flexibility. Maintaining respect for the participants' experiences was considered key to ethical practice and it was challenging to steer an appropriate path between allowing expression of feeling whilst also maintaining focus on the purpose of the interview. I believe that having a genuine interest in the experiences of my participants whilst maintaining a strong belief in the aims of my research enabled me to meet these challenges appropriately.

In terms of the questionnaire survey, a major concern was the length of the questionnaire. In addition to measuring the impacts of overtime on various aspects, including mental health, work-family conflict and job-related outcomes identified from qualitative results, the questionnaire survey also

measured potential moderating factors, which made the questionnaire relatively long even though the researcher made every effort to identify shorter versions of these standardized scales that have good psychometric properties. In order to increase participation and completion, the survey was designed within the possibility that the participant could return to the survey and continue to answer. However, a lot of questionnaires were still not finished. The response rate was low after the first invitation email, so a reminder email was sent.

Another concern is that the researcher has no evidence to demonstrate that the responses on the fully completed questionnaires are honest. On the current reflection, considering DeSimone, Harms, and DeSimone (2015)'s recommendations, they proposed that some bogus/instructed items could have been used in the survey to assist in identifying insufficient effort/inattentive respondents. However, this would have made the questionnaire even longer. Considering the detailed participant information and consent form, the survey design, the emphasis on voluntary participation as well as the interest the topic of overtime has generated, there are good reasons to believe that the responses reflected the lived realities of the participants. Finally, a fundamental lesson learned from these processes was that to do academic research, the researcher may encounter unexpected difficulties and should never give up. Whist encountering the challenges associated with data collection for this research it would have been tempting to abandon it at various stages due to the obvious and inherent imperfections in the process. However, reflecting on the fact that research in real-world situations will always have its methodological challenges and limitations, I was nevertheless able to maintain a belief that the purpose of my research was sound. By exploring the experiences of these participants, even with the caveat of the limitations discussed, I believed I would be able to uncover new ways of understanding the association between overtime and a variety of outcomes and that this might ultimately have the potential to benefit both individuals and organizations.

3.7 Chapter Summary

This chapter has presented detailed information about the methodology of the current research, which employed a sequential mixed method design, in-depth interviews followed by a quantitative questionnaire survey, to achieve its objectives. Each stage of the research process was explained, including the research design, data sources and ethical considerations. The next two chapters present the results of the two research studies, qualitative semi-structured interviews and a quantitative survey study.

Chapter 4: Study One Results and Discussion

4.1 Introduction

As discussed in Chapter 2, overtime has become a prevalent phenomenon in the current workplace and particularly in today's Chinese IT industry. Previous research has widely investigated the influences of overtime on employees in various aspects, such as mental and physical health (Beckers et al., 2004; Sparks et al., 1997), work-life conflict (Bohle et al., 2004), and job-related outcomes (Michie & Williams, 2003). However, research has rarely focused on employees in the IT industry specifically. Therefore, the first aim of this qualitative study is to identify the predominant influences of overtime on overtime employees' health and life.

Furthermore, more and more research has started to explore the solutions and potential influential factors that may be able to reduce the adverse influences of overtime on employees. High (psychological, physical and emotional) efforts invested but low rewards received induce increased psychosomatic health complaints, physical health symptoms and job dissatisfaction (Van Der Hulst & Geurts, 2001; Van Vegchel et al., 2001). The balancing of potential rewards versus investment are central to the phenomenon of mental fatigue (Boksem & Tops, 2008). Based on the theoretical foundation, ERI model (Siegrist, 1996, 1998, 2002b), the second aim of this study is to explore employees' attitudes towards rewards and its relevant influences on employees' mental health and emotional reactions. In addition to rewards, this study also aims to explore other factors that emerged from the analysis of participants' responses and that were considered important to buffer overtime impacts.

This chapter presents the results of the qualitative semi-structured interviews for the sample of 7 male and 6 female full-time employees in the IT industry based in China, who worked overtime in the previous six months. The chapter

begins by detailing the methodology. Afterwards, personal reflections are presented in a reflexive account. The results of the analysis are then presented. There are four main themes identified and in each theme section, sub-themes are presented in conjunction with supporting quotes from the participants. Finally, this chapter ends with a discussion section that summarises the findings of study one, compares the findings to previous studies in terms of consistency, opposition or new findings, and considers strengths and limitations of this study.

4.2 Method

Semi-structured in-depth interviews were conducted to explore the above issues.

4.2.1 Procedure

To obtain the organization's permission to conduct the research, the researcher contacted the targeted company's manger via email who was informed of the research, researcher's background, and the reasons why they were contacted. The researcher got the approval of access to contact their employees and the organization's human resource management provided 1023 employees' personal email addresses and some basic personal information, including gender and age.

The in-depth interview guides involving Chinese participants in the IT industry took a semi-structured format. The interview guides were designed to collect the relevant information for the purpose of the study. According to Bernard (2011) and Partington (2001), semi-structured interviews enabled the interviewer to control the process of interviewing, not only making the interviewing focus on the interview questions, but also allowing to follow the new ideas or new leads as they arise.

The interview questions were designed based on the combination of extensive review of the literature and the purposes of the study. The interview questions were organised into six sections (see Appendix 8) as follows:

1) Demographics:

Demographic information was asked of participants at the beginning of the interview. It aims to gather, on the one hand, personal information, including gender, age, education level, marital status and whether or not participants had dependents been taken care of; on the other hand, job information, including income and overtime hours on paid and unpaid overtime work. Asking demographic questions at the beginning of the interview was considered as an 'ice-breaking' technique. It was demonstrated to make the interviewees feel relaxed and was beneficial to establish trust as a good starting point (Shaughnessy, Zechmeister, & Zechmeister, 2015).

2) General information about overtime

This section generally explored the information about overtime in participants' current job through the question, 'Can you tell me something about the overtime in your current job?' DiCicco-Bloom and Crabtree (2006) indicated that the first question should be broad, open-ended and non-leading as the first goal of the interview was to get the interviewee talking. Therefore, this section may enable the interviewee to freely talk about issues surrounding the topic of overtime.

3) Feelings about overtime

This section focused on how the interviewee felt during or after overtime work. The first aim of the in-depth interview was to investigate the predominant mental health issues among overtime employees in the Chinese IT industry. Based on the previous studies, it is suggested the correlations between overtime and elevated mental health issues. For instance, Kuroda and Yamamoto (2016) claimed that long work hours contributed significantly

to deteriorations in workers' mental health. Workers' mental health was notably damaged if they work more than 50 hours per work.

4) *Influences on life*

This section further explored influences of overtime on employees' life. The fight to improve workers' quality of life began from the 1930s in American, when the productive measures were introduced, such as forty-hour workweek and minimum wage (Roediger & Foner, 1989). Overtime work induces work-life imbalance directly or indirectly, such as sleep disturbance, less leisure time and work-family conflict. For overtime workers, especially for those with children-care or elder-care responsibilities, it has become more difficult to deal with and balance the demands of the work and the home (Hill, Hawkins, Ferris, & Weitzman, 2001). This section sought to explore Chinese IT employees' experience of overtime in their life, further, to obtain the significant influence involved in the quantitative study.

5) Opinion on rewards

This section was designed to investigate overtime employees' opinion towards rewards at work. There were some major prompts as followed, aiming to help motive or guide participants freely expressing the relevant issues surrounding this topic: a) Is your overtime work compensated by extra rewards? b) Are you satisfied with the rewards? c) Do you think your effort and reward is balanced? d) What compensation would you like better for overtime work? Working conditions are considered as important factors which are likely to influence the impact of overtime on overtime workers. Whether effort invested and rewards received in job are perceived balanced or not by overtime workers refers to distinct reactions, such as aversion or willingness (see Siegrist, 2002b).

6) Overall attitudes

The aim of the last section was to let the participant summarise their attitudes towards overtime overall and add anything they wanted to talk and was not

asked in previous questions. The purpose of the interview was to identify major indicators of mental health, life and potential job-related outcomes associated with overtime work. However, it may also exist benefits or good feelings provided by overtime work. Therefore, this section enabled participants to comprehensively express their attitudes or opinions and avoided biased understanding or interpretation in the following analysis work.

Prior to the main interviewing sessions, the interview guides were piloted on one female and one male who worked overtime in the previous six months. This enabled the researcher to grasp how participants responded, how long the interviews would take, how understandable the questions were, and whether any pertinent issues arouse can be integrated into the interview questions. The pilot interviews provided the researcher with valuable experience and basic understanding of the topic before the main data collection (Barriball & While, 1994). It enabled the researcher to identify if there were any limitations within the interview design which could be modified before the major implementation. It is distinctly helpful to pilot the interview questions and adjust the interview guide accordingly before embarking into formal interviews (Marshall & Rossman, 2014). The pilot interviews were also essential in determining how the interview was to be conducted and estimating the approximate time per interview needed (Kvale, 2008).

A few amendments were made to the original interview guides. Based on the pilot interviews, some questions were re-worded to become as understandable as possible and some prompts were put forward in case participants need help generating ideas for discussion (e.g. rewards for overtime). The data from pilot interviews were then discarded to keep the identical interview structure. The interview would take approximately fifteen minutes, depending on each participant's response.

Formal in-depth interviews were conducted between July 2016 and September 2016. Potential interviewees were approached via an email invitation and were given details of the study. They were invited to participate into this online video chat interview with the researcher talking about their experiences of overtime in their work (The full email invitation can be found in Appendix 4). Potential interviewees responded by email or telephone and a convenient time for the interviewee was scheduled. Interviews lasted between 11 to 25 minutes.

The author conducted all the interviews via Internet chat at a time to suit the interviewee. The Internet interview was appropriate in this study as participants were Chinese employees based in China. Therefore, the researcher was able to conduct the interviews regardless of the location distance. All interviews took place outside the working hours to comply with the promise to the organization and interviews were tape-recorded. At the beginning of the interviews, interviewees were asked to read the 'Interview Consent Form' and give their formal agreement to participate in the study. Tape-recording was considered as a preferred method for recording responses as it enabled the researcher to focus on the content and development of the interviews.

Afterwards, interviewees were informed of the interview format and the expected time length of the interview. The research followed the semi-structured interview schedule in the same way for all participants. This assured in most cases, the interview questions guided to each interviewee were in the same order to improve standardization and prevent bias. Even though the procedure taken to standardize all interviews, the researcher was conscious of the fact that the interviews took place in social interaction contexts (Fagenson & Jackson, 1994). Moreover, Converse and Schuman (1974) observed that "there is no single interview style that fits every occasion or all respondents" (p.53), and hence, appropriate adjustments during the interviewing process were made necessarily by the researcher to make the

interviews flexible.

At the same time, during the whole interview process, the researcher made a conscious attempt not to lead participants in their responses. Clarifications related to research questions were made and any responses that were of interest but not directly associated with the interview questions were duly noted at the end of the interview questions. At the end of the interview, participants were thanked for participating and asked if they had any comments or queries about the interview. They were once more assured of the confidentiality and anonymity about all responses they gave.

Finally, thirteen formal interviews were conducted. When conducting the eleventh interview, the researcher found that few new ideas emerged, and therefore, two more interviews were continued to make sure thematic saturation was achieved. Concerning the number of participants that are typically required to achieve thematic saturation with a homogeneous sample, previous studies have argued that twelve participants are usually sufficient (e.g. Ando, Cousins, & Young, 2014; Guest, Bunce, & Johnson, 2006).

The audio recordings were transcribed into text transcripts accurately. After the major process of data analysis, the quotations used in this thesis were translated into English according to Brislin (1980)'s guidelines when writing up the qualitative results. The standard "forward-backward" procedure was applied to translate the quotations from Chinese into English. Two independent researchers in the psychological area translated the quotations from transcripts into English. Subsequently they were back translated into Chinese following a care cultural adaptation. The source language version was compared with back-translated version for linguistic and cultural equivalence and final translations were provided.

4.2.2 Participants

4.2.2.1 Personal Demographics

Table 4.1 shows the personal demographic details of overtime employees in China's IT industry interviewed in the study. The demographic information collected included gender, age, marital status, dependents information, educational attainments and income. The number of male and female participants was nearly equal. Approximate three quarters of participants were at the age of 21 – 30 and held the master educational degree. 69.2% participants were in the married status, whereas they currently did not have dependents been taken care of.

Table 4.1 Personal Demographics of Participants

	n (percentages)
Gender	
Male	6 (46.2)
Female	7 (53.8)
Age	
21-30	10 (76.9)
31-40	2 (15.4)
41-50	1 (7.7)
Marital status	
Married	9 (69.2)
Single	4 (30.8)
Dependents information	
Yes	4 (30.8)
No	9 (69.2)
Educational attainments	
Bachelor	3 (23.1)
Master	10 (76.9)

4.2.2.2 Job Demographics

Overtime Hours: Table 4.2 shows the overtime hours of thirteen participants in this study ranging from two hours to twenty-two hours. The average overtime hours was about 9 hours.

Income Level: Table 4.3 summarises the income level of the thirteen participants who had overtime experiences in the previous six months in this study. Most of the participants' income per month was between RMB 3000-5000 (*n* = 8, 61.5%), two participants between 5001-7000, one participant between 7001-9000 and two participants' above 9000.

Table 4.2 Overtime Hours of Participants

Participants	1	2	3	4	5	6	7	8	9	10	11	12	13
Overtime hours	13	6	5	4	5	3	22	2	3	15	13	20	6

Table 4.3 Income of Participants

	n (Percentages)
Income Level	
3000-5000	8 (61.5)
5001-7000	2 (15.4)
7001-9000	1 (7.7)
Above 9000	2 (15.4)

4.2.3 Data Analysis

Qualitative data analysis is not a totally separate stage of the research process. Instead, qualitative data analysis is a continuous process that takes place along with data collection and runs through the whole process of the research (Marshall & Rossman, 2011). In this study, the qualitative analysis occurred from the first interview and went on continuously to this stage. During the interviewing process, analysis of the preceding interviewing data was an influential factor affecting the subsequent interviews as new ideas may rise

from distinct responses and the understanding of the related research issues may be deepened and enriched. The ongoing analysis enabled the researcher to modify the interview timely, such as interview prompts, the sequence in which the questions were asked according to the interviewee's response. The qualitative data analysis progressed to a formal and systematic stage once all the interview recordings were transcribed.

Thematic analysis (Miles & Huberman, 1994) is commonly used in qualitative research and is a process by which themes are identified and developed from qualitative data and linked to the research objectives. It enables the researcher to flexibly interpret the findings (King & Horrocks, 2010). This study aims to investigate the influence of overtime on employees from: employees' feeling during or after the overtime work; the overtime's impact on employees' life; the job-related outcomes associated with overtime and rewards at work or overtime compensation. Therefore, thematic analysis enables the researcher to develop themes according to the interview data materials meanwhile taking the research objectives into account during analysing the data. Codes are primary techniques used in thematic analysis to develop themes and sub-themes. Codes can be obtained from previous studies on a subject matter or from the ongoing analyzing process of the interview data. Fundamentally, the aim of qualitative analysis was to develop a typology of categories or themes that generalizes the mass of the interview data. Miles and Huberman (1994) stated that analytical approaches used to describe and explain relationships involving in the qualitative subject matter, may be conducted deductively or inductively or using a combined approach.

In this qualitative study, the interview data were analysed by both thematic analysis and content analysis. Braun and Clarke (2006)'s strategies for a thematic analysis were employed, employing six step by step stages: (1) familiarisation with data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes and (6) producing the report. First, the author read and re-read the interview transcripts to

familiarize with data and noted down the initial ideas. Codes were given to the notes across the data set based on the research questions and existing theory and studies on topics mentioned in the interview objectives. Additional codes were added when the author immersed in the data and new issues emerged. As this stage progressed, the codes were collated into potential themes or sub-themes and all data were gathered to each potential theme. This resulted in a number of key themes and sub-themes linking the overtime experiences to mental health, conflict with life and job-related outcomes and other related subjects. The initial themes were reviewed and refined to make the themes work in relation to the coded data extracts and the entire data set. When data met internal homogeneity within themes and external heterogeneity between themes, the author started another stage, defining and naming themes to identify the essence of each theme. A template was produced which displays all the themes and subthemes in a hierarchical structure (King, 2004). The template can be found in table 4.4 below. The full thematic framework can be found in appendix B.

Additionally, after achieving the coding template, content analysis was conducted to quantify the frequency of each descriptor in each sub-theme across the transcripts. Content analysis was applied to systematically identify the frequencies of most referred descriptors from participants, which reflected significant concerns in each sub-theme (Elo & Kyngäs, 2008). The frequencies would provide much more meaningful information in the following analysis of qualitative results. The frequency tables are presented at the beginning of each main theme. The final stage is producing the report, which will be presented in detail in this chapter.

Table 4.4 Analysis Template

Main themes	Sub-themes	Descriptor
I. Overtime reasons (Why do overtime?)	Work-related reasons	Time node
		Nature of work
		Unexpected/ emergent work
		Interruption

	Personal reasons	Capability
		Personal qualities
	Cultural influence	Expectation
		Impression management
II. Outcomes of overtime	Attitudes towards overtime	Positive
		Negative
		Neutral
	Impact on health	Mental health
		Physical health
	Impact on life	Family
		Leisure
		Planning
	Job-related outcomes	Job efficiency
		Work engagement
		Intention to leave
III. Influential factors	Timing of overtime	Frequency
		Intensity
	Control	Time control
		Workload control
		Voluntary or compulsory
	Rewards	With or without Reward
		Effort-reward balance
		Type of reward
		Preference
IV. Solutions to overtime challenges	Practical	Personal
		Organizational
	Emotional	Internal
		External

4.3 Reflexivity

In accordance with core principles of thematic analysis described above, whereby the researcher's reflection on their role as an analyst and interpreter is a key part of the research process, reflexivity was undertaken throughout. The direction that the research process took and how the data was interpreted was at least in part, shaped by the personal and academic characteristics of the researcher (Mauthner & Doucet, 2003). The data were coded and themes identified and the analysis then discussed with a supervisor. This process allowed for consistency in the method but failed to provide multiple perspectives from a variety of people with differing expertise; this

could be considered a weakness of the research process, but is all the more reason to offer a reflexive account (Fereday & Muir-Cochrane, 2006). Hämmig, Brauchli, and Bauer (2012) suggest that in order to be reflexive in practices, there are three general areas in which researchers need to demonstrate awareness, and thus should account for the following:

i. “the personal and professional meanings their topics have for them”

ii. “the perspectives and experiences of the persons with whom they wish to do the research”

iii. "the audiences to whom the research findings will be directed”

[p1]

In accordance with Gilgun (2010)’s guidance, the researcher made reflexive notes after each interview and kept a journal throughout the process of qualitative study, including data collection, analysis and interpretation. Relevant reflections are considered to increase awareness of the research process, and a summary of these is presented below.

I am female, and at the time of conducting the interviews I was 25 years old. I am Chinese, MSc of Management Psychology degree obtained, and did not have overtime experiences when interning with a law company. Many people in my social circle, families and friends, work overtime. Some of them work overtime occasionally, but some undertake frequent overtime working. My father who works as an engineer, does overtime frequently. When he finishes work and is back home late, he is too tired to do anything, does not want to talk, and just lies on the sofa or bed having a rest. He takes less responsibility for housework and when having family activities, he has to return to the office to work overtime when the call from the company comes in to inform him of an urgent task. However, my father has the control over the time schedule, namely when to start and end his working day. Influenced by overtime indirectly, I sometimes found it disruptive to the family and to those working

overtime themselves. However, compared to the workers who have fixed working time, such as from 8 a.m. to 5 p.m. in the workday, my father does have some flexibility regarding his working schedule and can organize his time according to the current situation. For instance, he can deal with personal issues e.g. bringing my grandma to see a doctor. He therefore feels occasional overtime is acceptable.

My participants were selected from a mobile communication company in China who had overtime experiences in the previous six months. Personal differences between myself and my participants, most notably being a student and not having overtime experiences, may have limited my understanding of their exact feelings during or after overtime and the effects of overtime brought on them. Not sharing my experiences and standpoint towards overtime with my participants puts me as an 'outsider-researcher' at the beginning. With the progress of the interview, I may have come to understand, agree with and have empathy with what participants had experienced and their emotional states, which moved me towards being an 'insider'. Being an 'insider' brings both advantages and disadvantages; being an 'insider' may arouse sympathy and further stimulate participants to talk more about their overtime experiences; however, this may also lead the research process as participants may focus on expressing what they feel is going to be approved of and/or be emotionally resonant with the researcher (Lewig & Dollard, 2003). In addition, as discussed above, my father's experience has given me a better understanding of overtime's effects and how flextime contributes to the reduction of negative influences. My awareness of the combination of overtime and positive conditions that may reduce the negative influences has enabled me to conduct interviews, analyze data and report the findings from a non-judgmental perspective.

Conducting interviews was a challenging process for me. Some participants responded with very brief answers when asked about their feelings during or after overtime. After I gave examples of the type of experiences, I understood

some people to have had, they started to talk more about their own experiences, which appeared to be as a result of moving me towards the 'insider' position. Conversely, when participants kept talking about what adverse negative influences of overtime brought to them and poured out their complaints, I attempted to encourage them to talk from other perspectives. In addition, some participants appeared resistant to talking; when I detected this, I surmised that participants may have privacy concerns or concerns about the uses of personal data. Therefore, I tried my best to ease them and assure them the audio recordings would be deleted after being transcribed in order to help them to relax their guard and increase openness. In addition, interviews were conducted through online video chat, and has been suggested that in cyberspace there is a tendency to be more open with others, often complete strangers, than in real world communication. Even though the topic of overtime is not a sensitive issue, the online environment may encourage interviewees to express directly in their answers and give more candid and pertinent responses than in a face-to-face interview (Mark & Smith, 2012; Panatik et al., 2012). In addition, my previous experience of interviewing participants in other academic settings may have increased my ability to create rapport with participants and increase openness.

My previous experience influenced by my father's overtime, and the literature review guided the development of the interview questions and the prompts I used during interview. The interviews began with an opening question 'can you tell me something about overtime in your current job?' which is not leading and gives participants greater flexibility of what they would like to talk and what were most important to them; and then participants were asked about their feelings during or after overtime and the impacts of overtime on their life, which may have been influenced by my previous experience and my interest in this area.

In order to assure the research questions are appropriate and test the research process, two pilot interviews were conducted. Modifications were

made and reasonable prompts were put forward according to the feedback of pilot interviews. I therefore entered formal interviews with some prior knowledge of participants' potential feelings and attitudes towards overtime as well as potential psychosocial factors associated with overtime. Not in strict accordance with the interview schedule, the sequence of interview questions was flexible and therefore changed according to the content participants expressed. When I captured some important information, I would reflect this back to the participant in order to check my understanding and to give participants the opportunity to expand upon or describe further details. However, my focus point may have influenced the direction of the interview. For instance, where a participant mentioned the involuntary nature of her overtime work, the prompts that I gave as follow-up then motivated her to talk about what contributed to her involuntary overtime; it could be that the type of prompts I gave led the interview in a particular direction that would not have been the same direction if left to the participant to continue speaking in an unguided manner.

The analysis process may be influenced by my personal characteristics and position as an 'outsider-researcher'; the theme identification and interpretation may be different to those made by 'insider-researcher' who have firsthand overtime experiences. For example, there is potential that I may have judged the influences of overtime on participants' mental health based on my knowledge and understanding in this area. However, my focus and interests may influence the subsequent theme identification, which may be different to those made by either an 'outsider-researcher', or someone who does not have direct or indirect overtime experiences. I am interested in overtime influences and potential factors helping to reduce the influences, and therefore, I may have simplified what contributed to overtime working.

The above reflections are intended to allow the reader some insight into the factors that may have influenced the process of research and analysis, although it should be noted that subjectivity in qualitative research is an

accepted and inherent aspect of this methodology, and therefore should not be considered a major weakness in itself (Alvesson & Sköldberg, 2017; Gummesson, 2000).

4.4 Results

There are four main themes identified and in each theme section, sub-themes are presented in conjunction with supporting quotes from the participants. There are detailed next.

4.4.1 Overtime Reasons (Why Do Overtime?)

A key introductory aim of the qualitative research was to ascertain the reasons for participants in IT industry working overtime.

Table 4.5 below shows the overtime reasons for working overtime from the sample in IT industry based in China. These categories were collated by the researcher from the thematic analysis and the number of respondents mentioning each theme one or more times were quantified through the content analysis.

Table 4.5 Overtime Reasons

Subtheme	Theme description	Number of respondents mentioning this theme one or more times
Work-related reasons	Time node	8 (62%)
	Nature of work	12 (92%)
	Unexpected/emergent work	12 (92%)
	Interruption	2 (15%)
Personal reasons	Capability	4 (31%)
	Personal qualities	4 (31%)
Cultural influence	Expectation	1 (8%)
	Impression management	4 (31%)

4.4.1.1 Work-related reasons

Participants gave various reasons for working overtime from different aspects. The most prevalent of these was work-related reasons, including time node, which means at special time period, such as the end of month, quarter or year, the overtime was frequent; the nature of work, which means some elements of work may cause overtime, such as high workload, job position requirement, work flow, work complexity and work schedule; unexpected/emergent work, which incudes short notice, emergent tasks, uncertainty at work; and interruption during the workday, which includes inspection, reports or meetings, training and disturbance by other things outside the work.

"We have to do more overtime at the end of the month". (time node)

"Our work is strongly process-regulated, such as process-related deadlines". (nature of work)

"When shopping or eating outside with my family, I have received calls from the company, saying I need to go to the company to work overtime." (unexpected/emergent work)

"Sometimes your work schedule is interrupted by an unexpected added meeting… Some work cannot be done in the working hours according to the original plan, so I need to work overtime to complete my planned tasks." (interruption)

4.4.1.2 Personal reasons

Participants also explained that they engaged in overtime was due to personal reasons, such as capability and personal qualities.

"When your skills are not good enough for the current task, you need to learn something new and usually have to work overtime". (capability)

However, another participant expressed the competent worker had more tasks and worked overtime more.

“The amount of overtime reflects the effectiveness of a person or the importance of a position. A capable man is always busy… Tasks are not equally distributed… The hours and amount of overtime is related to your ability and importance.” (capability)

Additionally, some participants mentioned personal qualities as an invisible reason for influencing the decision to work overtime or not.

“A person who works overtime usually has a sense of responsibility… Although overtime takes their personal time, like me, actually I don’t want to work overtime, but I still choose to work overtime.” (personal qualities)

4.4.1.3 Cultural influence

A country’s traditional culture or organizational culture influences workers’ performance, attitudes and behavior. Chinese workers usually perceive their manager or superior as a person with authority. They behave or perform according to their managers’ expectation. In addition, the group makes workers bond tightly and influence each other. Workers’ overtime is affected not only by their tasks and personal intention but also by the working environment (Mingyan, 2012).

Common themes in this study included manager or leader’s expectation for overtime on participants:

“Leaders generally like to see you busy, so some people work overtime just to make the right impression.” (expectation)

Also important was participants' impression management on others:

"Sometimes we work overtime because the leader is still in the office." (impression management)

"At the end of each month, the whole group is working overtime, so sometimes even though your work is complete, you still stay there." (impression management)

4.4.2 Outcomes of Overtime

The thematic analysis sought to uncover the impacts of overtime. The following part details the results of the thematic analysis with respect to the sub themes of attitudes towards overtime; impact on health; impact on life; and job-related outcomes, which appeared to be related to the mechanism of overtime discussed above. These subthemes and their descriptors are presented in Table 4.6.

Table 4.6 Outcomes of Overtime

Main themes	Sub-theme	Descriptor	Number of respondents mentioning this theme one or more times	
Outcomes of overtime	Attitudes towards overtime	Positive	Moderate overtime	5 (38.5%)
			Overtime control	6 (46.2%)
			Rewards	8 (61.5%)
		Negative	Long-term and high intensity	8 (61.5%)
			Temporary overtime	6 (46.2%)
			Compulsory	7 (53.8%)
			No rewards	8 (61.5%)
		Neutral	8 (61.5%)	
	Impact on health	Mental health	Fatigue	12 (92.3%)
			Depression	10 (76.9%)
			Stress	10 (76.9%)

			Anxiety	3 (23.1%)
		Physical health	9 (69.2%)	
	Impact on Life	Family	12 (92.3%)	
		Leisure	8 (61.5%)	
		Planning	9 (69.2%)	
	Job-related Outcomes	Job efficiency	5 (38.5%)	
		Work engagement	4 (30.8%)	
		Intention to leave	3 (23.1%)	

4.4.2.1 Attitudes towards overtime

A few participants (*n* = 8, 61.5%) admitted that overtime was unavoidable, inevitable and necessary at work:

"It was common and usual in the work. Moderate and occasional overtime was acceptable." (neutral)

Different aspects of overtime induced different attitudes. Positive attitudes towards overtime were mainly contributed by factors: the overtime was moderate; it could be planned or scheduled in advance by participants; and the overtime was appropriately rewarded:

"In terms of occasional overtime, when you complete it, sometimes you feel quite a sense of accomplishment." (moderate)

"Most overtime can be arranged in advance and sudden overtime is relatively infrequent. I would work overtime if there were more projects." (control)

"If there is an overtime fee, I am willing to work overtime because every minute you work is rewarded. When you do a thing and get some benefits, you will feel that you are willing to do it." (reward)

To the opposite, participants held the negative attitudes towards the overtime, which were long-term and high-intensity; temporary or emergent; compulsory; no or less rewarded; as well as meaningless and unproductive:

“For example, if it is for a long time, the workload is too heavy. Non-stop overtime will be boring.” (long-term and high intensity)

“Temporary and sudden overtime is more annoying. Especially if the day has been arranged, I have to cancel some of my plans that will be disrupted. It is really disgusting.” (temporary)

“I have become more and more resistant to working overtime… I do not want to be forced to stay at the office at night and sit there. The efficiency is quite low.” (compulsory)

“I don’t want to work overtime because there’s no reward.” (no rewards)

4.4.2.2 Impact on health

As described in the Methodology Chapter (Chapter 4) the interview schedule asked participants how they felt during or after overtime and the impact of overtime on their life. When asked how the participant felt during or after overtime work, participants responded in relation to two areas, namely mental health and physical health. The main issues discussed in relation to mental health have been further classified as depression, stress and anxiety. The definitions and symptoms used in determining these constructs are provided in table 4.7.

Table 4.7 Evidence-based Definitions and Symptoms of Depression, Stress and Anxiety

Constructs	Symptoms
Depression	Feelings of sadness, tearfulness, emptiness or hopelessness (Dekker, 2014)
	Sleep disturbances, including insomnia or sleeping too much (Nutt, Wilson, & Paterson, 2008)
	Tiredness and lack of energy (Braley, Chervin, & Segal, 2012)
Stress	Environmental and/or internal demands exceed the individual's resources for managing them (Holroyd & Lazarus, 1982)
	A reaction to a stimulus event (Skinner, 1985)
	Stress can be defined as "an underload or overload of matter, energy or information input to, or output from, a living system" (Steinberg & Ritzmann, 1990, p. 140)
Anxiety	An emotion characterized by feelings of tension, worried thoughts and physical changes like increased blood pressure (Kazdin & Kazdin, 2000)
	A state consisting of psychological and physical symptoms caused by a sense of apprehension at a perceived threat (Akiskal, 1985)

a. Mental health

Depression

Another serious mental health problem caused by overtime was depression. Although the majority of the participants (*n* = 10, 76.9%) did not specifically use the word depression, they did refer to a variety of feelings related to depression including feeling spiritless, inactive, unhappy, miserable, dysphoria, irritable and so on:

"If I worked overtime late in the evening, I felt quite tired after going home and did not want to speak. The next day I would be without spirit and became inactive." (depression)

"If there were so many tasks during these days, I felt upset, really upset. It seemed that overtime was never over." (depression)

Stress

The majority of participants (*n* = 10, 76.9%) experienced aggravating stress or tension during or after the overtime:

"Even after overtime, you were always thinking how to solve the problem. That pressure was actually big." (stressful)

The influence was particularly significant when the overtime was emergent or high intensity:

"Sudden overtime was also urgent. We worked very late, sometimes to the middle of the night. The manager would also come to the office to discuss countermeasures. So, the pressure was particularly great for this emergency overtime." (emergency overtime)

"In the month of May, overtime was very frequent. From the beginning of the month to the twentieth basically, every day I worked late. Then the intensity was relatively high, the pressure would be relatively great." (high intensity)

Anxiety

In addition, participants may feel anxious during the overtime work or after the overtime:

"Sometimes, for example, there was a case coming in at nine o'clock in the evening, and then you were asked to get it completed by ten o'clock. During

that moment you were quite crazy because you were urged to deal with this thing, so at that time you felt very anxious." (anxious)

Another participant expressed that temporary overtime that was demanded at short notice created a state of anxiety for him:

"At the weekends, for example, you were playing outside, but you were afraid of your phone ringing to call you back to the office and work overtime… You would definitely feel more or less anxious." (anxious)

b. Physical health

The two most popular issues in relation to physical health were fatigue and sleep problems.

Fatigue

The most serious issue was fatigue; nearly all of the participants (*n* = 12, 92.3%) expressed they felt tired during or after overtime work. Some overtime fatigue was acute，usually caused by high hours overtime in one day or in a short time:

"Tired, indeed I am really tired. Especially sometimes when I have worked overtime until eleven o'clock in the evening, I was really very tired." (acute fatigue)

"If a case must be completed today or in such a situation, we would stay up very late, sometimes until the early morning. It was particularly tiring." (acute fatigue)

For those who worked overtime continuously, they suffered from accumulated and chronic fatigue:

“If it is a kind of long-term overtime, you certainly feel, oh, tired. If the recent task is heavy, or the frequency of overtime is high, my brain will be in a state of exhaustion and excitement. You cannot rest well.” (chronic fatigue)

Some participants specified that they felt tired when they had insufficient rest and bad recovery during the overtime period:

“I was tired during the overtime. And then when I came home after overtime, the rest time was short. I can’t rest too well. It still leads to tiredness the next day.” (bad recovery)

Three participants explicitly expressed that they needed a rest to recover from the overtime especially after the long-term or high strength overtime:

“When we do overtime, we often work all night… After overtime, I was quite tired and wanted to quickly go home to take a rest.” (rest needed)

Another serious matter suffered by participants (*n* = 8, 61.5%) was sleep difficulties, including insomnia, bad quality of sleep, irregular sleep and less sleep time:

“After long hours of overtime work, your brain was still in a state of excitement. In fact, you were unable to fall asleep after going home, but tossed and turned in bed over and over again.” (bad sleep)

“When I was back home after overtime, the time for sleep was reduced. I can’t rest well.” (bad sleep)

Participants also claimed that overtime increased the risks of other health issues, such as sickness, cold, headache, cervical spondylosis, lumbar disc herniation and irregular diet:

“My personal feelings and experience are, if I work overtime two days a week for continuous two weeks, I will get a cold, definitely get a cold. The body really cannot stand it, not just psychological pressure. Then when thinking I have to work overtime again, I feel a headache and brain swelling. It is not just every day’s fatigue, but health is really impacted.” (cold)

4.4.2.3 Impact on life

a. Family

When asked about what impacts of overtime exert on participants’ life, almost all participants (*n* = 12, 92.3%) suggested the impact on family. For participants within dependents, they had less time to take care of and accompany their child or parents:

“Working overtime reduces the time spent with families.” (less family time)

Some participants’ families were also affected more or less:

“Frequent overtime may induce family members’ misunderstanding and conflicts with them.” (conflict)

Similarly, another participant expressed she may bring the adverse emotions to her families after overtime work:

“If I worked overtime late one night, I was very tired after going home and did not want to speak. If I was in a bad mood, I would bring it to my family and my tone speaking with my family was not very good.” (bad influence)

b. Leisure

Another major impact of overtime on participants’ life was leisure. Participants complained that the overtime reduced their time for entertainment activities, leisure, exercising, relaxing and so on:

“Overtime takes up your time to, for example, go out for dinner, see a movie, or go to the gym. Certainly, it will have an impact.” (entertainment)

“The overtime decreases your personal time for rest.” (rest)

c. Planning

Overtime work prevented participants (*n* = 9, 69.2%) from making a plan for other activities in life. In particular, the temporary or emergent overtime disrupted plans already established:

“As our job is IT maintenance, for example, when the system fails suddenly, then you are asked to go back urgently to check the data or cause, or you are made to go to an emergency business trip… No matter if it is the weekend or day and night, you are on call. Tickets were booked in the morning and you left in the afternoon. Planned good events were all upset.” (disturbance)

Compared to temporary overtime, overtime that can be scheduled in advance in a large extent reduced the interruption:

“You originally arranged the weekends for an activity, going out or for other entertainment, but suddenly you are asked to work overtime… Then you have to. Instead, if the overtime work was able to be scheduled, no matter how late I worked on Friday, I can plan for my Saturday and Sunday.” (schedule autonomy)

4.4.2.4 Job-related outcomes

More than half the participants (*n* = 8, 61.5%) referred to the job-related outcomes relating to overtime, including job efficiency, work engagement and intention to leave.

The overtime work, which is less productive and inefficient, may be caused by high workload, frequent overtime, long-term overtime, compulsory overtime, negative and reluctant overtime.

“The temporary overtime which disrupted my plan made me feel resentful and resistant. At least I can’t accept it calmly. The overtime efficiency would not be particularly good.” (unproductive)

“I do not want to be tied to the office every night, sitting there, and the efficiency is pretty low.” (low job efficiency)

It should be highlighted that four participants, who mentioned work engagement in this study, all decreased their engagement at work because they felt the imbalance between their effort invested and rewards received:

“There’s only monetary compensation for dinner after a certain time of day… I do not work overtime now. The imbalance reduced my enthusiasm for work.” (less work engagement)

Additionally, three participants who reduced the work engagement mentioned above expressed the intention to change the current job:

“I have thought about changing jobs because I heard from someone in another company that they can accumulate overtime hours in exchange for holiday. They can, why can’t we, so I want to change jobs.” (turnover intention)

“There’s no reward for overtime work and I cannot see any development or promotion in my job, so I want to search for another job if possible.” (low job satisfaction and turnover intention)

4.4.3 Influential Factors

One key purpose of the qualitative interviews was to probe for the possible factors affecting the effects of overtime.

Table 4.8 Influential Factors

Main themes	Sub-theme	Descriptor	Number of respondents mentioning this theme one or more times	
Influential Factors	Timing of overtime	Frequency	12 (92.3%)	
		Intensity	11 (84.6%)	
	Control	Time control	10 (76.9%)	
		Workload control	3 (23.1%)	
		Voluntary or involuntary	12 (92.3%)	
	Rewards	With or without Reward	12 (92.3%)	
		Effort-reward balance	Under-rewarded	3 (23.1%)
			Balanced	5 (38.5%)
			High-rewarded	2 (15.4%)
		Type of reward	Financial	5 (38.5%)
			Compensation	6 (46.2%)
			Development	3 (23.1%)
		Preference	Financial	7 (53.8%)
			Compensation	5 (38.5%)
			Emotional	2 (15.4%)
			Development	4 (30.8%)
			No matter what reward, don't want to work overtime	1 (7.7%)

4.4.3.1 Timing of overtime

In this study, participants mentioned that overtime differed in terms of frequency and intensity. Some participants stated that the frequency of overtime was relatively low on usual working days, but at the end of the month or during specific period, the overtime was frequent.

"When it comes to the key time node of the project, such as mid-term inspection or evaluation, continuous weeks of overtime occur." (frequency)

Moreover, when participants mentioned high frequent overtime in a period, they usually specified the overtime was high intensity.

"When we were busy, we worked six days a week and eleven hours per day… Long-term, continuous overtime is often high intensity." (frequency and intensity)

Some participants specified that sometimes long hours' overtime on one day was also intensified.

"Once we worked overtime until two o'clock in the morning. I was really exhausted. It was a miserable experience." (intensity)

4.4.3.2 Control

Another theme emerged from participants' responses. Participants considered the control at the work they possessed crucially related to the impact of overtime.

The majority of respondents (*n* = 10, 76.9%) believed how much autonomy they have on working time was influential:

"I have control over my working time - it depends on myself when to start and end work during the working day." (time control)

One participant specified control over the time as important:

"It depends on whether the overtime is under your control or if it is temporary overtime that you can't control, which I think makes a great

difference. It is okay if I can arrange the overtime. If it is always temporary overtime, I will be irritated." (time control)

Similarly, a participant expressed less time control when he felt he had low autonomy:

"I feel time is out of my control for sudden and emergent tasks." (time control)

In addition, a small number of participants (n=3, 23.1%) referred to the control over the workload:

"The task is sometimes more and sometimes less. When you feel the task is too much, you can talk with your boss that you have too much to do recently and then tasks can be adjusted. You don't have to keep doing it all the time." (workload control)

On the other hand, a participant expressed less control over the amount of work:

"If a task is assigned to you, you have to work overtime and complete your work."

Nearly all of the participants (*n* = 12, 92.3%) in this study mentioned overtime control, focusing on whether it was voluntary or compulsory. Participants provided a range of conditions where working overtime was a voluntary arrangement, and specified what conditions forced them to work overtime compulsorily.

Participants gave various factors that may contribute to the decision to undertake voluntary overtime: autonomy on overtime schedule, reasonable and moderate levels of overtime:

“If the overtime is reasonable and appropriate, and it can be arranged by myself, it is acceptable.” (voluntary overtime)

and appropriate compensation:

“If there is overtime pay, I like to work overtime because the time I spend on overtime is rewarded.” (voluntary overtime)

In terms of compulsory overtime, participants gave a number of responses about factors causing compulsory overtime, including temporary urgent increase in work, high workload, continuous and high intensity overtime.

“Temporary work implies some coercion.” (temporary work)

“At the end of each month, there are many business cases, so we are busy and overtime work is required.” (high workload)

“I have an aversion to long-term and high-intensity overtime. Even though I am reluctant, I have to do it and have no choice.” (high intensity)

4.4.3.3 Rewards

a. With or without rewards

When asked about the issue of rewards or compensation for overtime, participants firstly expressed whether they received rewards or not. Nearly half (*n* = 6, 46.2%) participants expressed that they had no or almost no rewards, indicating that no matter how many overtime hours they worked, there was no compensated rewards for the extra time investment. One interesting thing was that two participants specified that they had rewards previously, but now they didn’t have:

“Overtime rewards are based on pay grades. If your salary is at a relatively low level, in order to compensate your entire income monthly, there is overtime pay. But if your salary reaches a certain level, there is no overtime pay. So I had overtime rewards previously, but now I do not.” (with or without rewards)

In addition, three participants expressed that they had specific rewards for overtime whereas three participants indicated that they did not have specific rewards for overtime hours, but they received rewards after the tasks were completed. In other words, their rewards were output or performance based rather than time based:

“We do not have specific rewards for overtime… If you work overtime and get some work achievements, there will be some overall reward for your performance at the end of each month or year.” (overtime compensation)

b. Effort-reward balance

When asked if participants felt their effort and rewards were balanced, participants who worked overtime but received no or little rewards, felt unrewarded, imbalanced and unsatisfied, especially for participants who worked overtime regularly and long term:

“You feel all your time is working. Then when you go back home, it is nearly eleven o’clock… But there is very little money for the overtime. Nominally the reward will be reflected a little in the performance. But it still does not meet our expectations, or the reward does not obviously reflect our effort. The overtime payment is terrible.” (under-rewarded)

Participants felt exacerbated dissatisfaction when the overtime was compensated with imbalanced rewards and they were forced to work overtime:

“Now I’m more and more averse to overtime. I don’t want to be forced to sit in the office to work overtime after work in the evening and there are limited rewards for overtime work.” (under-rewarded and compulsory overtime)

The participants who received rewards for overtime based on company regulation thought it was acceptable and moderately balanced:

“Our company has overtime payment: overtime pay on working days is 1.5 times as much as usual, 2 times on Saturday and Sunday and 3 times on statutory holidays. It is a relatively standard compensation.” (balanced)

Some participants expressed even though there were no specific rewards for overtime, they felt their effort invested and rewards received at work were balanced to a large extent:

“When you complete a task, it has a bonus. It is proportional with the task: more tasks, more bonus and fewer tasks, less bonus. The overtime payment isn’t changeless. Our work is rewarded in that way, mainly by performance assessment.” (high-rewarded)

c. Type of reward

In terms of reward type, five participants received money; Six participants received some compensation for overtime, including supplementary vacation, overtime dinner and taxi fee; Three participants referred to the possible development opportunities at work, although this type of reward was less certain:

“If you work hard, there may be good opportunities in the future, like promotion or something.”

d. Preference

When asked what rewards or compensation participants would like better for overtime, the majority of participants (*n* = 8, 61.5%) wished to be compensated by money in the first place:

"Of course, the most direct is financial compensation. Hopefully the overtime is linked with money." (money)

Participants who did not receive financial rewards for overtime felt more strongly that monetary rewards should be given. However, financial rewards were not the preferred desire of overtime compensation for all participants. A small number of participants (*n* = 2, 15.4%) preferred compensation in time:

"As far as possible I want time compensation for the hours I spent on overtime. The compensation for money is secondary - it is best to compensate for the time." (time compensation)

In addition, apart from the rewards of money and time, two participants hoped to get some emotional support from their manager or boss, including verbal rewards, spiritual encouragement and care:

"After overtime, you certainly want to get approval or something like that. The boss knows that you are working overtime and you are working hard. The boss could give some acknowledgement to you on "*wechat*" (a social software in China) or the next day ask you about yesterday's overtime work." (support)

A few participants (*n* = 4, 30.8%) also had a preference for development in their career, including promotion, skill improvement and good learning opportunities. What should be noted is that one participant stressed no matter what rewards were compensated for overtime, she did not want to work overtime.

"Overtime for me, any compensation is not worth it because I will get sick. Even if you give me a vacation or money, in fact, my body cannot recover." (no preference)

4.4.4 Solutions to Overtime Challenges

A theme rerated to the solutions to overtime emerged from the data analysis. A number of participants (*n* = 11, 84.6%) gave their opinions on how to improve the conditions of overtime and reduce the negative influence of overtime.

Table 4.9 Solutions to Overtime Challenges

Main themes	Sub-theme	Descriptor	Number of respondents mentioning this theme one or more times
Solutions to overtime challenges	Practical	Personal	8 (61.5%)
		Organizational	6 (46.2%)
	Emotional	Internal	5 (38.5%)
		External	4 (30.8%)

4.4.4.1 Practical

Practical ways to reduce the adverse impacts of overtime could combine both personal and organizational aspects:

"One requirement for myself is trying to improve work efficiency to finish work in a limited time, so that I can balance my work and life, rest time and entertainment time." (personal)

"It is best for the company to provide some overtime rewards to employees. They shouldn't let this become one incentive to induce employees to complain or even leave the company." (organizational)

For another example, “If the overtime work is really emergent and necessary, nevertheless the company should improve the compensation for overtime.”

4.4.4.2 Emotional

The other way was to improve emotional support from personal internal adjustment and gaining more external support.

“There is no need to be always in the mood of resentment about overtime. After all, the nature of work is like this.” (internal)

“Sometimes it is helpful that the superior manager comes to look around and motivate you during overtime.” (external)

4.5 Discussion

4.5.1 Summary of Findings

The purposes of study one was to on the one hand, explore the employees’ experience of overtime and identify the predominant impacts of overtime on employees’ mental health and life; and on the other hand, investigate the influences of WTC and rewards on these impacts.

Firstly, this study indicated overtime reasons, namely why employees do overtime work, involving work-related reasons, personal reasons and cultural influence. Work-related reasons include time node, nature of work, emergent work and interruption at work. Personal reasons refer to capability and personal qualities. Cultural influence may impose underlying pressure on employees to work overtime, such as expectation and impression management.

Secondly, the second theme, outcomes of overtime, identified the salient impacts of overtime on employees' mental health, work-life balance and job-related outcomes. The first sub-theme, attitudes towards overtime, was generated from respondents' descriptions of overtime that recurred frequently throughout each interview. It suggested three potential factors associated with overtime that may lead to distinct attitudes towards overtime of workers, namely overtime intensity, control and rewards. In terms of mental health, the majority of participants (77%) experienced depression and stress, followed by anxiety. Nearly all the participants (92%) claimed that they suffered from fatigue during or after overtime. Sleep difficulties is another serious issue caused by overtime. Regarding effects on life, work-family conflict is the most predominant issue mentioned by nearly all the participants (92%), followed by less leisure time and interruption on pre-arranged plans. Job-related results associated with overtime in this study refer to job efficiency, turnover intention and work engagement.

Thirdly, this study identified three factors potentially affecting the influences of overtime. The obvious one is the timing of overtime. Different levels of frequency and intensity caused different degrees of impacts. In addition, two psychosocial factors, namely control and rewards were found to mitigate or exacerbate the influences of overtime. When employees have control over worktime, they can schedule their work according to their current situation that can avoid fatigue, work-family conflict as well as other adverse impacts as much as possible. The workload control helps to reduce overtime work. In particular, voluntary and compulsory are two opposite poles of overtime control. Employees may voluntarily work overtime when they feel they have autonomy on the schedule of overtime, and where overtime is reasonable and moderate and appropriately compensated. Meanwhile, employees may have compulsory work overtime when temporary urgent tasks come in, the workload is high as well as continuous and high intensity overtime. Compensation for overtime or balance between effort and rewards may

create feelings of happiness and in some way compensate for the adverse feelings and effects caused by involuntary overtime.

Finally, several solutions to overtime challenges were suggested in terms of both practical and emotional ways, such as work efficiency improvement (personal) and compensation (organizational); self-adjustment (internal) and social support (external).

4.5.2 Comparison to Previous Research

In this research, some findings are consistent with previous studies whilst some new findings are generated. The following section compares the findings within the four main themes with previous research and outlines areas of commonality and highlights where this research offers new insights.

Firstly, in terms of overtime reasons, namely why employees do overtime, investigation of the results in this research revealed that work-related reasons, personal reasons and cultural influence were the major causes making employees to work overtime. Two of these, work-related reasons and cultural influence are consistent with previous research findings; for instance, Houdmont, Zhou, and Hassard (2011) identified four reasons for overtime: job demands, work culture, intrinsic motivation to work overtime, and anticipated rewards for overtime; similarly, Beckers et al. (2004) and Van der Hulst et al. (2006) indicated that work characteristics had strong impact on working overtime.

The current study also found that work-related reasons seemed to be the most prevalent reason, including time node, nature of work, unexpected/emergent work and interruption, in which nature of work and unexpected/emergent work were especially significant influence factors inducing overtime work. This is consistent with the findings of Tsutsumi, Kawanami, and Horie (2012) who indicated that job demands such as high

workload contributed significantly to overtime work as well as with Houdmont et al. (2011) who found that job demands were the most influential predictor for overtime hours.

In the current study, cultural influence was also found to exert an underlying influence on employees leading to overtime work in the workplace. For instance, participants choose to work overtime in order to cater to management expectations and make a good impression. Cultural influence had been demonstrated in the previous research based in both individualist and collectivist cultural context. Goldenhar, Hecker, Moir, and Rosecrance (2003) found that culture influenced the decision on working overtime in the construction industry of United States. Workers usually say yes when the manager asks them to work overtime and if found to be refusing it many times, they would find their career impeded. This demonstrates the cultural norm surrounding what it takes to forge a good career in an individualist society, and whilst the pressure to undertake overtime in a collectivist society has a similar outcome, the reasons are somewhat different. Triandis (1995) indicated that in collectivism society, the group bound members tightly and made them influence each other at work such that they would work overtime to complete the group goal. Further, Houdmont et al. (2011) found that Chinese office workers were influenced by the overtime work culture in which employees usually see themselves as parts of the organization and expect to take on the duties imposed by it, which is in line with the findings in the current study; here, participants claimed that they still stayed in the office and worked overtime after work despite that they had completed their own work but in order to help other colleagues in the same group. It is worthwhile noting that the personal reasons for overtime found in this research (namely capability and personal qualities), to the author's knowledge, has rarely been investigated in preceding studies.

Secondly, the major outcomes caused by overtime were identified, including attitudes towards overtime, impact on health, life and job-related outcomes

that align with previous findings. Overtime participants held positive attitudes or at least they felt overtime was acceptable if the overtime was reasonable and moderate, was able to be scheduled in advance by themselves and was rewarded appropriately. This is entirely in keeping with previous research. For instance, Tucker and Rutherford (2005) indicated that workers viewed overtime positively because of the financial rewards, meanwhile on the other hand, negative attitudes have been associated with high intensity (e.g. Jungsun, Yangho, Chung, & Hisanaga, 2001; Spurgeon et al., 1997; Virtanen et al., 2009), effort-reward imbalance (e.g. de Jonge et al., 2000; Siegrist, 2002a; von dem Knesebeck & Siegrist, 2003) and less control (e.g. Golden & Wiens-Tuers, 2006; Kinman & Jones, 2008b; Moen et al., 2011).

Mental and physical health problems arise due to overtime that was supported by previous findings. This study found that overtime work was associated with anxiety and depression (Kleppa et al., 2008). Virtanen et al. (2012) indicated that overtime work acted as a predictor of major depressive episode. This study also found overtime appeared to be a risk factor causing stress (e.g. Åkerstedt et al., 2002; Goldenhar et al., 2003).

In terms of physical health, the current research found overtime work was related to increased fatigue, bad recovery and poor sleep that were consistent with previous research (e.g. Beckers et al., 2004; de Jonge et al., 2000; von dem Knesebeck & Siegrist, 2003). Van der Hulst et al. (2006) indicated that overtime employees need recovery especially in high strain jobs (high demand, low control). Goldenhar et al. (2003) claimed the extended overtime work could disturb workers' sleep schedule and was negatively associated with the sleep quality. Virtanen et al. (2009) found long working hours shortened sleeping time and increased difficulty in falling asleep. Additionally, several physical health problems identified in this study, including cold, headache, cervical spondylosis and lumbar disc herniation, were identified in previous findings (e.g. Caruso et al., 2004; Iwasaki, Takahashi, & Nakata, 2006; Kawada & Ooya, 2005; Van der Hulst, 2003).

Regarding effects on life, overtime work was found to induce work-family conflict, leisure time deprivation and interruption towards plans already made, which were consistent with the literature reviewed. For instance, Goldenhar et al. (2003) found the stress of overtime brought to lives outside of work. Long working hours is associated with work-family imbalance, including taking care of children and parents, doing housework and communicating with partners (Grzywacz & Marks, 2000; Hämmig & Bauer, 2009; Jansen et al., 2004). Other studies have found that leisure time decreased due to working overtime (Heraty, Morley, Cleveland, Kinman, & Jones, 2008; Siegrist et al., 2004; Van Vegchel et al., 2002). Furthermore, this research highlighted the interruptive influence of overtime on worker's schedule outside the work. In particular, emergent or temporary overtime exerts a much more negative impact. Siegrist (2002a) claimed that in the software industry, overtime planning was extremely poor caused by 'estimate inaccuracy and time-to-market pressure', leading to detrimental influence on workers' quality of lives. On the contrary, overtime that can be scheduled in advance by workers causes less interruption. In terms of this finding in current research, namely the workers' autonomy on overtime schedule, to the author's knowledge, there is still a shortage of previous studies specifically investigating it.

Job-related outcomes in terms of job inefficiency and turnover intention found in this research are supported by previous literature. Shimizu et al. (2004) reported that low productivity was closely related to the overtime working, whilst Michie and Williams (2003) found that overtime increased workers' turnover intention. Although previous studies have indicated a relationship between overtime and less organizational commitment and low job performance (e.g. Adler et al., 2006), few studies have explored the impact on work engagement. In demonstrating that overtime work, especially compulsory and inappropriately rewarded overtime, decreased workers'

enthusiasm to engage in work, the current research therefore adds to the body of knowledge on this topic area.

The findings of the third theme suggested the potential influencing factors that may aggravate or buffer the impacts of overtime. The influence of frequency and intensity of overtime, (here, the first sub-theme of influential factors), is a finding that aligns with previous studies. In the present study, participants considered occasional and moderate overtime to be reasonable and acceptable at work, whilst, long term and frequent overtime was objectionable. In terms of previous research, there are consistent findings that demonstrate the detrimental impact of high intensity overtime, whereas the adverse of moderate overtime on health and well-being has not been consistently demonstrated (Geurts & Sonnentag, 2006). Taris et al. (2011a) stated that working a moderate amount of overtime did not usually cause elevated risks of health whereas these would worsen with increasing overtime. Dahlgren et al. (2006) concluded that one week of overtime work with a moderate workload created no significant effects on physiological stress; however, sleep was adversely influenced, with insufficient sleep during overtime work and increased problems with fatigue and sleepiness. In addition, the present study highlighted frequent overtime may bring about long hours overtime and high intensity, further induced chronic fatigue. The high intensity overtime is not merely caused by weekly or monthly long hours of overtime. One day's long hour working can also induce high intensity overtime, such as overtime working until mid-night that would induce acute fatigue. High frequency and high intensity result in long hours' overtime that would be related to chronic fatigue. Much of previous research uses "overtime hours weekly" to generally measure the level of overtime intensity (e.g. Beckers et al., 2004; Bell & Hart, 2003; Gralla, Kraft, & Volgushev, 2016; Grosch, Caruso, Rosa, & Sauter, 2006; Iwasaki et al., 2006; Trejo, 1993).

This research also identified two psychosocial factors that might exert distinct influences on overtime, namely control and rewards. Regarding control,

several findings of the present research tie in well with results of previous studies. Regarding the control that participants can exert, the most predominant was worktime control followed by workload control, confirming the results of previous studies that suggested that worktime control is a potential factor moderating the overtime's influences (e.g., Ala-Mursula et al., 2005; Beckers et al., 2012; Joyce et al., 2010). More precisely, this study supported the notion of flextime, namely when to start and end the time of workday, in Ala-Mursula et al. (2002) WTC model; the current research also specified the control over overtime schedule that how much control participants were able to dominate may play distinct role in overtime. For instance, the overtime work which can be arranged and planned in advance by participants, exerts less adverse impact, whereas the temporary or urgent overtime induces much more serious influence. It seemed that the more autonomy the participant has, the less adverse impacts the overtime causes. Tucker and Rutherford (2005)'s study claimed that the impact of overtime appeared to contingent on the amount of control that workers have over the overtime hours and when to work overtime. However, the qualitative results in the present research did not identify the other sub-dimensions of WTC in previous studies, such as break control and the distribution of workdays over the workweek (Ala-Mursula et al., 2002; Geurts et al., 2009; Siegrist, 1996), which may because these aspects were not available to these participants or participants did not mention them as the interview guidance did not focus on worktime control.

In addition, this study highlighted voluntary or compulsory overtime was one specific factor inducing distinct influences that was consistent with limited previous studies. This research suggested, compared to voluntary overtime, compulsory overtime caused much more serious negative feelings, such as resentment, stress, aversion, anxiety and fatigue. Ota et al. (2005) indicated that voluntary and compulsory are two opposite poles of overtime control; involuntary overtime workers suffered from higher fatigue and lower satisfaction and rewards may partly reduce the adverse effects of compulsory

overtime. The current research found that three factors contributed to a willingness to work voluntary overtime: these were autonomy on overtime schedule, reasonable and moderate overtime and appropriate compensation. Compulsory overtime was caused by urgent tasks that were out of participants' control, high workload, continuous and high intensity overtime, and unsatisfying rewards. Previous research (Watanabe & Yamauchi, 2016) found two reasons for engaging in voluntary overtime: intrinsic motivation and extrinsic motivation; whilst two reasons for having to undertake involuntary overtime focused on workload and conformity, which was consistent with this present study's findings that rewards were likely to stimulate employees to engage in voluntary overtime; constant and high intensity overtime and cultural influences seemed to make employees engage in involuntary overtime.

In terms of rewards, several participants in this study received specific compensation for overtime which was investigated in previous studies (e.g. Ota et al., 2005; Sasaki et al., 2007). The present study found that even though some participants received compensation for overtime, they felt that the compensation was not enough for their extra effort invested in the overtime work. There were also some situations in which there may be no specific compensation for overtime, where instead the overall rewards were given based on job output or performance. To the opposite, even though some participants did not receive specific compensation for overtime, they felt satisfied with the overall reward at work compared to their effort invested including overtime work.

Therefore, considering these, in addition to measure compensation for overtime, one of the most influential models in overtime research is Siegrist (1996)'s Effort-Reward Imbalance model (ERI) and to a large extent the findings of the present study support the large body of research that previously endorses this model. Briefly, the model investigates the balance between effort invested and rewards received at work, which is classified into

three levels, effort more than rewards, effort balanced with rewards and effort less than rewards, which was widely used and further investigated in previous studies (e.g. de Jonge et al., 2000; Li, Yang, Cheng, Siegrist, & Cho, 2005; Van Der Hulst & Geurts, 2001).

This model was relevant to the current study as ERI especially causes stress and dissatisfaction in the overtime situation. This research suggests that whether employees could feel balance between effort invested and rewards received at work makes a big difference in overtime's effects. When participants felt imbalanced, adverse effects were produced, including bad emotions, decreased motivations, less work engagement and increased turnover intention; oppositely, when participants perceived balance between effort and reward, they were less against overtime and performed with less negative emotions at overtime work; these findings were consistent with previous research. Previous studies have also indicated that effort-reward imbalance induced negative outcomes on mental health (Kinman & Jones, 2008b) and job-related outcomes (Li et al., 2005). Bell, Hart, Hübler, and Schwerdt (2000) found that workers who were remunerated higher wages invested more effort and hours above the paid hours at work, whereas overtime without rewards was negatively related to work productivity.

In particular, the current research highlighted that the negative impact of effort-reward imbalance was increased accompanied by involuntary overtime working, which is in keeping with the research by Van Der Hulst and Geurts (2001), which found that the adverse impact of low job rewards was exacerbated by the compulsory overtime work applied to workers. In terms of the type of rewards, the current study identified financial compensation, time compensation and promotion or learning opportunities in career and whilst Ota et al. (2005) measured rewards for overtime in terms of money and time. Participants in the present study held different preferences towards rewards; to the author's knowledge, this preference for rewards was rarely explored in previous studies.

Finally, this study found several solutions to overtime challenges, although this topic was not widely referred to by participants. There were two possible ways to improve overtime conditions from practical and emotional perspectives. In terms of practical ways, improvements can be achieved from both personal and organizational aspects. “Organizational aspects” supports findings in previous studies investigating solutions to decrease adverse impacts of overtime, mainly focusing on worktime autonomy arrangement (e.g. Ala-Mursula et al., 2005; Geurts et al., 2009; Knauth, 1998) and improvement of compensation for overtime (e.g. Huang, 2016; Ota et al., 2005; Westover & Taylor, 2010). However, “personal aspects” has been rarely investigated in previous studies. In terms of emotional ways, this study indicates solutions relating to internal self-adjustment and external social support. This finding supports previous studies investigating the general and positive impact of social support at working conditions (e.g. Moen et al., 2011; Pomaki & Maes, 2002; Vancouver, 2000), however self-adjustment lacks of investigation in previous studies. Solutions in personal ways need more investigation.

Overall, this study found that personal reasons inducing overtime seemed to cause fewer negative attitudes towards overtime, such as lacking of skills and interruption by personal issues. This study also suggested that autonomy over worktime and overtime and appropriate rewards would arouse voluntary overtime and further induce fewer negative emotions and impacts. To the opposite, high intensity and out of control’s overtime, and unsatisfying rewards would cause involuntary overtime and further lead to elevated negative influences.

4.5.3 Strengths and Limitations

This qualitative study provides detailed information about overtime experiences among employees who worked in mobile communication

industry in China; even though overtime working is prevalent in the IT industry, which has been rarely investigated in previous studies; furthermore, research on overtime in China is relatively rare with most overtime research focusing on Western countries. The utilization of one-to-one interviews facilitated in-depth express of overtime experiences, feelings and influences among a target group of employees in the IT industry. The open-ended question allowed participants to provide their own unprompted responses. Furthermore, these interviews were carried out through online video chat, which enabled the researcher to gain visual clues to catch interviewees' expression changes timely further avoid any coercion during the interview and avoid embarrassment.

This study provides a comprehensive picture of overtime influences, including health, life and job-related outcomes. Findings of this qualitative study will guide the quantitative study to further investigate the relationships between overtime and variables identified in qualitative study, which has supported generalisations about the phenomenon under study. This qualitative research conducted among an IT company will enable more effective triangulation of findings between the quantitative study within this thesis than if different samples had been used for qualitative and quantitative investigations. This is the first study, as far as the author is aware, to explore autonomy over overtime schedule, with the findings on the attitudes and impacts of planned versus unplanned/emergency overtime contributing new insights to the field of overtime research.

However, a relatively small number of participants were interviewed, which could be considered a weakness of this research. There may also have been some selection bias as employees who responded to invitation letters may had different characteristics and experience compared to those who did not respond or declined to take part, which means that the findings may not be generalizable. In addition, the designation of participants experiences as "mental health" problems was achieved by the matching of phenomena that

participants described and academic definitions of specifically identifiable mental health issues, however, as the researcher is not an expert in the area of mental health, it is possible to argue that these categorizations may lack an element of precision. For instance, it is hard to distinguish or identify clearly about whether the fatigue is mental fatigue or physical fatigue in terms of participants' relevant descriptions.

4.5.4 New Findings and Research Implications

Firstly, this current study may have made some contributions to the academic fields. Findings in the current research suggest that current Western theory and evidence might also apply to some extent in the collectivist cultural context, but this suggestion needs more research to strengthen its validity. This study indicated overtime reasons: work-related reasons and cultural influence found in this study were investigated in previous studies and consistent with proceeding findings, whereas the current study found that employees may work overtime due to personal reasons, such as capability and personal qualities, which was rarely identified in the previous research. Personal reasons seem to be a new finding that needs further exploration. This new finding suggests future studies to widely explore issues of overtime brought about by personal reasons, as this may lead to employees' distinct attitudes and emotions towards overtime and further cause different levels of impacts on employees. For instance, if there is interruption during the work caused by personal issues outside the work, employees may tend to work overtime voluntarily to complete the work on that day. If employees' skills are not enough for current tasks, they may work overtime to improve their capability and get the work done. In addition, employees who have high sense of responsibility towards their organization may engage in overtime working.

Secondly, some recommendations have been put forward in terms of actions taken by the organization that might improve the situation surrounding overtime and lessen the negative impact of overtime. These include

encouraging the organization to improve strategic planning to reduce the need for last-minute, unplanned overtime. Employees may work overtime due to a lack of useful competences at work, meaning that work cannot be completed in the allocated time; in this case, the organization should provide employees with training opportunities to improve specific competencies or skills required at work. Employees may work overtime due to the interruption by personal issues during the workday, and in such cases worktime flexibility would be beneficial to employees that they can adjust the work time according to their present situation and prevent overtime work. Further investigation about the personal reasons for overtime is needed to understand overtime reasons comprehensively.

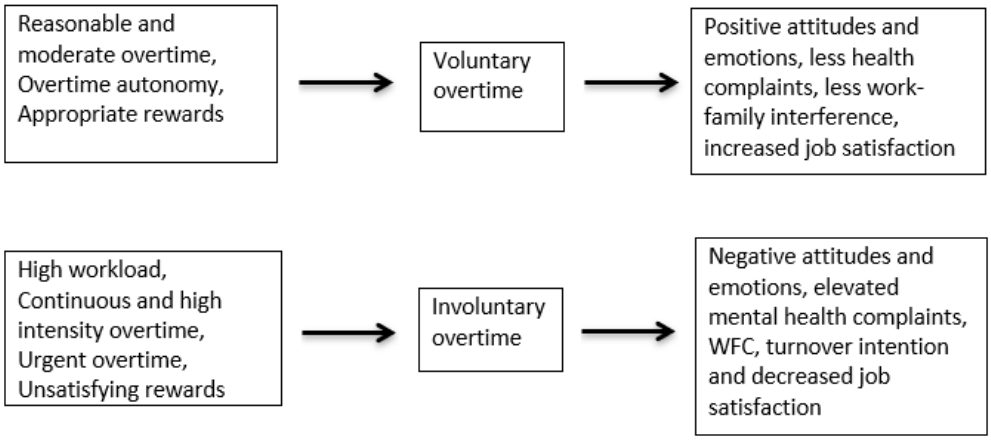
In terms of control, although workload control was not mentioned as frequently as worktime control in participants' responses, it was considered as one potential factor that may cause overtime and result in compulsory overtime. It is recommended that future research investigate job-related control in various aspects. Furthermore, this study indicated that rewards were likely to reduce overtime employees' complaints and negative emotions. In addition, participants held different preferences towards rewards that suggest organizations should improve their rewarding system to reward employees appropriately and base rewards on employees' preferences to maximize the positive effects of rewards.

Thirdly, this qualitative study provided some guidance for the next phase of current research. The first two research aims were conceived at the outset of the research and the third aim was generated following analysis of the qualitative findings, namely the influences of involuntary and voluntary overtime. This study identified some of the factors that resulted in overtime being undertaken on a voluntary versus involuntary basis; this is important because the voluntary versus involuntary nature of overtime further results in different outcomes. Figure 4.1 presents a visual model of the relationships

between factors that influence the voluntary versus involuntary nature of overtime and potential different consequences.

This model demonstrates that the outcome of working overtime on a voluntary basis are much more positive than where overtime is worked on an involuntary basis. This is a new and important finding within the current study as it shows the need for employers to attend to the factors that promote voluntary overtime working, rather than to rely on making overtime compulsory for employees. Employers should be encouraged to plan strategically and promote autonomy and flexibility amongst their workforce, with a view to achieving the positive organizational and individual outcomes that are associated with voluntary overtime.

Figure 4.1 Factors Influencing Voluntary versus Involuntary Overtime and Consequences



Chapter 5: Study Two Results and Discussion

5.1 Introduction

This chapter reports the findings of the second study which focused on exploring the relationships between overtime hours and overtime employees' mental health and physical health, work-family conflict (WFC) and job-related outcomes and the effects of rewards, WTC and involuntary and voluntary overtime on these dependent variables. The previous research and findings from qualitative study has suggested that overtime work seems to be associated with mental and physical health complaints, WFC and poor job-related outcomes. Overtime employees suffered elevated mental health problems during or after overtime work. According to the qualitative findings, individuals experienced the following predominant mental health complaints: depression, anxiety, stress and physical problems: fatigue and difficulty recovering.

Overtime work inevitably produces disruption to employees' lives. Work-family conflict was another major problem caused by overtime work. Frequent overtime and emergent overtime especially produced significantly greater interference to family and social activities. Where employees lack control over overtime work, negative impacts are exacerbated (Bohle et al., 2004). Informed by qualitative results, WFC was selected as another variable in this research.

Long working hours seems to be associated with not only poor personal health but also adverse organizational outcomes, such as burnout (Van Der Hulst & Geurts, 2001), increased turnover intention, absenteeism (Michie & Williams, 2003), decreased organizational commitment, low job performance (Adler et al., 2006), and job satisfaction (Brauchli et al., 2014). As a result of the interview findings, it was considered important to further investigate

turnover intention and work engagement in this study, and informed by the literature, job satisfaction was focused on.

Hypothesis 1. Overtime Hours is positively associated with adverse health problems, WFC and poor job-related outcomes.

Previous research has indicated that the relationships between overtime and its influences are complex. In addition, findings of the qualitative study also indicated that rewards and WTC are likely to reduce the negative influences of overtime on overtime employees. Furthermore, whether overtime is involuntary or voluntary has been identified as another important influential factor in relation to the impacts of overtime and is found to have correlations with rewards and WTC. Psychosocial job characteristics such as job demands, job variety and job control are likely to determine the extent to which overtime work exerts impacts on employees. Compared to non-fatigued overtime employees, fatigued overtime employees were found to have more difficult work situations, such as high job demands and low job control (Beckers et al., 2008). In terms of occupational health, employees who were exposed to high demands whilst having low resources at their disposal suffered more job strain (Bakker & Demerouti, 2007). Imbalance between high efforts spent and low rewards received would cause chronic work-related stress (de Jonge et al., 2000). On the other hand, high resources seem to enable overtime employees to deal with the high job demands, lessen job stress, negative emotions, work-to-family interference, and improve job satisfaction as discussed in Chapter 2.

As discussed in Chapter 2, according to effort-reward imbalance (ERI) model and job demands-resources (JD-R) model, rewards and WTC are identified as two influential factors in relation to the effects of overtime on employees. From the interview data analysis, we found that even though overtime work was not compensated with specific rewards, employees' overall efforts at work were balanced with rewards, as rewards were output-based overall. The

model proposes that employees expect fair reward or compensation for their effort invested at work, which is considered as a social exchange process. When employees perceive balance between their efforts and rewards, they would be willing to invest further efforts at work, otherwise aversion will occur, further inducing such as distress, fatigue and dissatisfaction.

Hypothesis 2. Individuals receiving compensation for overtime report fewer health problems, less WFC and better job-related outcomes than individuals not receiving compensation for overtime.
Hypothesis 2a. Individuals adequately rewarded report fewer health problems, less WFC and better job-related outcomes than individuals inadequately rewarded.

The findings from the preceding interviews suggested that parts of worktime control were associated with overtime workers' mental health, work-life balance and job-related outcomes. High autonomy in planning overtime work in advance reduced workers' resistance about overtime and the interruption caused by emergent overtime in life. Flextime control enabled overtime workers to begin the working day a bit late when they worked overtime in the previous night, so that they can get a relatively good recovery from the extensive fatigue of overtime. Moreover, the systematic literature review also indicated the association between WTC and health/well-being, work-non-work balance and job-related outcomes (see Nijp et al., 2012).

High control over daily working hours significantly reduced employees' depressive symptoms (Takahashi et al., 2011). However, in terms of WTC, the findings about sub-dimensions, namely control over time-off and control over daily hours in relation to the mental & physical health, WFC, and job-related outcomes are still unclear and inconsistent (Nijp et al., 2012). In addition, previous research has focused on the effects of rewards and WTC individually, and to the author's knowledge, there is scarce research investigating the

combination effect of rewards and WTC, or their interaction effect on mental health, fatigue, WFC and job-related outcomes.

Hypothesis 3. Individuals reporting high or moderate control over time-off report fewer health problems, less WFC and better job-related outcomes than individuals participating in low control over time-off.

Hypothesis 3a. Individuals reporting high or moderate control over daily hours report fewer health problems, less WFC and better job-related outcomes than individuals participating in low control over daily hours.

Hypothesis 3b. The interaction effects of control over time-off with gender and dependent status on health problems, WFC and job-related outcomes will be significant; high control over time-off will have greater influence on female and employees who have dependents.

Hypothesis 3c. The interaction effects of control over daily hours with gender and dependent status on health problems, WFC and job-related outcomes will be significant; high control over daily hours will have greater influence on female and employees who have dependents.

Hypothesis 4. The interaction effect of ERI and WTC significantly adds to the explanation of health problems, WFC and job-related outcomes; adequate reward exerts greater influence on employees with low WTC than on employees with moderate or high WTC.

Moreover, whether employees engage in involuntary overtime or voluntary overtime appeared to make a difference on overtime's impacts. The distinction between voluntary and involuntary overtime is assumed to be an important moderator between overtime work and well-being (M. A. Kompier, 2006). A small amount of previous research has identified some of the factors which may be related to the likelihood of choosing to do overtime even when it is voluntary, such as more job variety and proper compensation (e.g. Beckers et al., 2008). Caplan and Jones (1975) stated that due to an inappropriate amount of work required to be completed in a given amount of

time, overtime work occurred. Hackman (1992) claimed the group influence on workers that overtime work generated from implicit pressures from colleagues or supervisors. Moreover, the extrinsic and intrinsic motivation model was widely used in previous studies to illustrate work engagement at work (e.g. Amabile, 1993; Nyambegera & Gicheru, 2016; Van Yperen, Wörtler, & De Jonge, 2016).

However, there is still hardly any research investigating the influence of involuntary or voluntary overtime on employees' mental health, WFC and job-related outcomes. One of the few exceptions, Watanabe and Yamauchi (2016), was a quantitative study exploring the impact of involuntary and voluntary overtime on work-nonwork balance, finding that involuntary overtime has a negative influence on work-nonwork balance and voluntary overtime work has a positive effect. As the involuntary overtime and voluntary overtime dimensions were rarely investigated in previous research, and in the absence of previous research exploring the relationships between involuntary & voluntary overtime and health, WFC, and job-related outcomes, we propose the hypotheses:

Hypothesis 5: Involuntary and voluntary overtime (workload, conformity, extrinsic motivation and intrinsic motivation) significant affect health, WFC and job-related outcomes.

Hypothesis 6. Voluntary overtime is positively related to WTC and negatively related to ERI; involuntary overtime is positively related to ERI and negatively related to WTC.

Furthermore, results from qualitative study (figure 4.1) indicated that ERI may induce involuntary overtime and further influence outcome variables in this research and WTC may cause voluntary overtime and further affect outcome variables. A mediation model seeks to explore and identify the mechanism or process between an independent variable and a dependent variable through

the effect of a third variable known as a mediator. Rather than a direct influence of the independent variable on the dependent variable, mediation proposes that one variable affects another variable via the inclusion of a third mediator variable. That is to say the independent variable influences the mediator variable, which in turn influences the dependent variable. Therefore, two mediation hypotheses are proposed.

Hypothesis 7. Involuntary overtime mediates the effect of ERI on mental health, WFC and job-related outcomes.
H7a. Voluntary overtime mediates the effect of WTC on mental health, WFC and job-related outcomes.

Moreover, according to a review of literature in terms of potential intervening factors affecting the relationships between overtime and outcome variables in this study (Chapter 2) and findings from the qualitative study, (the third theme, influential factors in Chapter 4), this study examined if rewards, WTC and voluntary overtime respectively moderated relationships between overtime and outcome variables (mental health, WFC and job-related outcomes). According to Baron and Kenny (1986), moderation occurs when the relationship between two variables depends on a third variable, namely a moderator. The effect of moderation or interaction implies that the moderator (third variable) influences the direction and/or strength of the relationship between independent and dependent variables. Hayes (2017) describes a situation in which X's effect on Y varies as a function of a third variable M, the moderator variable. As such, testing for moderators or interaction allows for the examination of other variables on which the independent variables' effect on the dependent variable is conditioned on. Moderators have been posited to work in one of three mechanisms. A moderation effect may be (a) enhancing, where increasing the moderator would increase the effect of the predictor (IV) on the outcome (DV); (b) buffering, where increasing the moderator would decrease the effect of the predictor on the outcome; or (c) antagonistic, where increasing the

moderator would reverse the effect of the predictor on the outcome (Hayes, 2013).

The following moderation hypotheses are put forward:

Hypothesis 8. Effort-reward balance buffers the influence of overtime hours on mental health, WFC and job-related outcomes.
Hypothesis 8a. Control over time-off buffers the influence of overtime hours on mental health, WFC and job-related outcomes.
Hypothesis 8b. Control over daily hours buffers the influence of overtime hours on mental health, WFC and job-related outcomes.
Hypothesis 8c. Voluntary overtime buffers the influence of overtime hours on mental health, WFC and job-related outcomes.

In terms of the influence of personal information on mental health, previous studies have indicated that gender differences may contribute to differentiation in mental health outcomes, such as depression (e.g. Kessler, 2006; Parker & Brotchie, 2010; Weissman et al., 1993; Weissman & Klerman, 1977), anxiety (e.g. Gater et al., 1998; Leach, Christensen, Mackinnon, Windsor, & Butterworth, 2008; McLean & Anderson, 2009) and stress (e.g. Cleary, 1987; Mirowsky & Ross, 1995). A striking feature of prevalent mental health problems is that women are twice as likely as men to experience depression (Nolen-Hoeksema, 2001; Sloan & Sandt, 2006). Men and women appear to show different responses in stress and also have different coping styles; in general terms, findings indicate that women seem to be more emotional and less rational than men (Matud, 2004). This may be a factor underpinning the large body of preceding evidence showing that women complain more frequently of sleep disturbance than do men (e.g. Arber, Bote, & Meadows, 2009; Hohagen et al., 1993; Lu et al., 2005).

Secondly, in terms of WFC, previous studies showed that women seemed to suffer increased work-family conflict than men (e.g. Duxbury, Higgins, & Lee,

1994; Duxbury & Higgins, 1991). However, a meta-analysis conducted by Byron (2005) investigating the antecedents of WFC, indicated that demographic characteristics, such as gender, marital status and income, were related weakly to WFC and acted as poor predictors of WFC alone. Thirdly, in terms of job-related outcomes, empirical research and theoretical literature showed that there is inconsistent evidence that demographic factors are related to employees' job satisfaction (Brush, Moch, & Pooyan, 1987). High income is not significantly associated with job satisfaction as long hours may reduce satisfaction (Clark, Oswald, & Warr, 1996). Income appears to not directly related to turnover intention, whereas equality or inequality and procedural justice perceived by employees at work may affect their turnover intention (e.g. Clark et al., 1996). Therefore, in order to minimize the effect of confounding variables, it was considered important for the present study to consider personal information as potential control variables, including gender, age, marital status, dependents status, education level and income.

The remainder of this chapter is structured in three main sections. The methodological details are presented in the next section focusing on data collection, participants, variables and measures, and analysis performed. The second section presents the results. Finally, a discussion of these results is included with a focus on policy implications and avenue for future research.

5.2 Method

5.2.1 Participants and Data Collection Procedure

Participants were employees in the Chinese IT industry. The inclusion of samples was employees who had overtime experience in the previous six months, as the purpose of this study is to investigate issues surrounding the topic of overtime. Participants had to be currently employed by an IT company and worked in full-time within contract hours, whereas part-time employees were excluded as overtime hours is considered as an influential

factor in this research. Participants were employees in any positions in their company.

The quantitative phase of this thesis was based on an online questionnaire. The questionnaire was available on the webpage designed for this research project (https://www.wjx.cn). The surveys were in Chinese, a back-to-back translation was performed according to the recommendations of Brislin (1980) and Maneesriwongul and Dixon (2004). Scales which have Chinese versions were directly used and scales which were used in the previous published research based in the Chinese context were achieved from the authors. Other scales used in this study were translated into Chinese within the standard "forward-backward" procedure. The researcher and another psychology professional translated the items and a provisional version was provided. Subsequently it was back translated into English and following a careful cultural adaptation the final version was provided.

The following stage of quantitative study enabled the researcher to explore the quantitative relationships between variables and validate findings from qualitative study (Bernard, 2011). The key objective of the questionnaire survey was to get around 300 responses from Chinese IT employees. Taking the theory and the reality into account, the sample target was set at 300. According to Kreft, Kreft, and de Leeuw (1998), the minimum size for the higher-level variable in multilevel model is 20. Considering two potential moderators in this study, namely WTC and rewards within six sub-variables, the minimum suggested sample size was 120 in order to achieve a statistical power of 80 percent, assuming a medium effect size of .15 and a .05 significance level. Nevertheless, Field (2009) claimed that for SPSS analysis, the more data, the better. Therefore, considering the achievable access to Chinese IT overtime employees together, the sample target was appropriate in the current study.

The invitation email was sent to employees in the China Mobile Communications Corporation, Taiyuan Branch, in which the online questionnaire link was attached. At the beginning of the questionnaire survey, a consent form was attached to inform the participant what would be involved in the study, the anonymity and confidentiality of their answers, as well as the freedom limit that it would not be possible to withdraw the data when they clicked 'submit' at the end of the questionnaire because of the anonymous response. One month after the invitation email being sent, the responses were 206. Therefore, the second time email was sent to kindly remind potential participants and 59 more questionnaires were completed. Finally, a combined total of 265 participants completed the online questionnaire.

Even though the number of responses did not meet our expectation, the number is enough for the most complicated analysis in this study. The power analysis for each analysis was presented at the beginning of each section. The total response rate is 22.3% in this study. Table 5.1 shows the comparisons between total distribution and actual responses based on gender and age, as only this information had been able to be achieved from the HR department of the organization.

Table 5.1 Questionnaire Distributions and Response Summary

Personal information	Total Distributed *N* (percentage)	Questionnaire Responses *n* (percentage)	Response Rate (percentage)
Gender			
Male	602 (58.8)	144 (54.3)	23.9
Female	421 (41.2)	121 (45.7)	28.7
Age group			
21 – 30	531 (51.9)	122 (46.0)	23.0
31 – 40	277 (27.1)	109 (41.1)	39.4
41 – 50	123 (12.0)	33 (12.5)	26.8
51 – 60	92 (9.0)	1 (0.4)	1.1

5.2.2 Variables and Measures

The quantitative questionnaire design was based on the findings of the qualitative study, as well as extensive literature review (see Chapter 2). This section is an account of the questionnaire components and how they were derived. Decisions on selection of measures were mainly based on reliability, length and suitability to Chinese context. Reliability of questionnaire is a way of accessing the quality of the measurement. In order to consider a result valid, the measurement must first be reliable. In addition, as this research involves various dependent variables, short version of each scale was selected to make the whole questionnaire shorter. Response rate may be lower for longer questionnaire than shorter questionnaire (Rolstad, Adler, & Rydén, 2011; Smith, Olah, Hansen, & Cumbo, 2003). Moreover, whether scales are widely used in Western context is suitable to Chinese context is considered as this research was conducted in the Chinese cultural context. The questionnaire was organized into eight sections (see Appendix 10) as followed:

1) Demographics

This section was used to collect personal and job demographic data including gender, age, marital status, dependents' situation, education level and income level using multiple-choice questions. The investigation of these demographics was based on previous studies which suggested to be likely relevant to overtime and its influences as discussed in the introduction above.

2) Overtime Information

The first question was whether the participant had worked overtime in the previous six months or not, as this present study focused on issues surrounding the overtime. Therefore, if participants answered 'no', the survey would be directed to the end of the questionnaire and thanks for their participation. If participants answered 'yes', they were able to continue answering the questions. The information about overtime hours weekly was

collected. The overtime hours included time spent on overtime work conducted at home but did not include the commuting time. The measurement for the length of overtime by measuring overtime hours per week, was widely used in the previous studies (e.g. Beckers et al., 2004; Gralla et al., 2016; Trejo, 1993).

With respect to overtime hours, even though self-report measure is questioned by many researchers considering its reliability, it is still the most popular method for the following reasons: firstly, sometimes the researcher cannot be able to access to the data of overtime work hours from the human resource management; secondly, in some companies, overtime work hours are not recorded as the evaluation is based on job performance or output rather how many overtime hours employees worked; thirdly, it may be more precise to get the data from employees themselves as some overtime work is conducted at home instead of in the work place. In addition, Spector (2006) has suggested that it does not essentially lead to problems of common method bias to use self-report measure for data collection.

3) Reward at Work

This section included two parts of scales measuring the specific reward for overtime work, and overall reward for effort investment at work.

a. Compensation for Overtime Work

This scale measured whether there was specific compensation for employees' extra overtime work. It was measured with the following item: ''Are your overtime hours being compensated in time and/or money?'' Response categories were: (1) ''no, my overtime hours are not compensated''; (2) ''yes, compensation in time and money''; (3) ''yes, compensation only in time''; (4) ''yes, compensation only in money.'' This variable was recoded into two subgroups, (1) no compensation group (initial response category 1) and (2) compensation group (containing respondents from initial response categories

2, 3, and 4). Time and monetary reward were two elements in the measurement, which was also used in Beckers et al. (2008)'s study.

b. Effort-Reward Imbalance (ERI)

The ERI questionnaire aims to test the Effort-Reward Imbalance Model (Siegrist, 1996, 1998). This ERI Model based questionnaire is relevant to the present study. The model can be reasonably applied into the overtime work situation, as extra effort investment is required for overtime work, which may or may not be rewarded with time compensation or monetary compensation.

The Chinese version of ERI questionnaire was used in the study. This scale includes 23 items, within 6 items for measuring effort, 11 items for reward (covering esteem, financial, and status rewards), and 6 items for overcommitment. Examples of effort, reward and overcommitment are: "I am often pressured to work overtime"; "Considering all my efforts and achievements, my salary / income is adequate"; and "As soon as I get up in the morning I start thinking about work problems" respectively. These scales have been shown to have good psychometric properties (Siegrist et al., 2004). All items were scored on a four-point scale, from 1 (strongly disagree) to 4 (strongly agree). Higher scores of each scale signify higher efforts, rewards and over-commitment (Cronbach's α: efforts = 0.83; rewards = 0.88; over-commitment = 0.92). The effort/reward ratio (effort/reward ratio = effort score/ reward score) was calculated and categorized into ratio > 1 (effort more than reward); ratio < 1 (reward more than effort); ratio = 1 (effort equal to reward). The higher the effort/reward ratio is, the more stress is (Li et al., 2005). Two formulations of the ERI ratio were used in this study: categorical values (ratio > 1 and ratio ≤ 1) and continuous value.

4) Worktime Control (WTC)

The Worktime Control measure used in this study was from Ala-Mursula et al. (2005)'s seven items scale. This scale measures from two aspects: control over daily hours and control over time-off, including flextime, schedule control,

break control and leave control. For example items: “How much you can influence the starting and ending times of a workday?” and “How much you can influence the taking of breaks during the workday?” Responses to each item were given on a five-point scale (1=very little, to 5=very much). The measure had good internal consistency, with a Cronbach’s alpha of 0.82. This scale or modified items were widely used in previous studies as it enabled not only to measure global WTC, but also to measure WTC in various sub-dimensions (e.g. Geurts et al., 2009; Takahashi et al., 2011; Vahtera et al., 2010). The mean of each scale score was calculated and divided into tertiles to categorize low, moderate and high levels (e.g. Ala-Mursula et al., 2004; Takahashi et al., 2011).

5) Psychosocial Factors

Watanabe and Yamauchi (2016)’s scale, which measured overtime control from four sub-dimensions, namely involuntary overtime work due to workload, involuntary overtime work due to conformity, voluntary overtime work due to extrinsic motivation and voluntary overtime work due to intrinsic motivation. The same structure was used in this study. However, the original scale cannot be directly used in this study as their questionnaire was designed for measuring nurses’ overtime control and some items were relevant to nurses’ specific work situation. Items 1 to 7, 13 to 15 and 19 were slightly modified to suit the current participants and items 8 to 12 and 16 to 18 were kept from Watanabe and Yamauchi (2016)’s scale. For two examples: the original item “I have to work over hours because there are so much works to be done in my ward” was modified into “I have to work overtime because there is so much work to be done in a limited time”; “The work hour in my ward tends to be long because there are sudden deterioration of the patients and emergency admission” to “I have to work overtime because of some interruptions during the workday”. These modifications were designed from interviewees’ responses.

6) Mental and Physical Indicators

Combined with the literature review, the qualitative interview results suggested the following dominant psychological indicators associated with overtime work.

Mental Health

The DASS (depression, anxiety and stress scale) corresponds with the findings in this study. Chinese version of DASS-21 was used in this study. DASS-21 is an instrument within 21 items assessing current ("over the past week") symptoms of depression, anxiety, and stress. Each of the three scales contains seven items. Each item is rated on a 4-point combined severity/frequency scale to measure the extent to which individuals have experienced each item over the past week. The scale ranges from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time. The sum of each scale is calculated, with higher scores representing more serious problems. Chinese version of DASS-21 items was adequately and appropriately translated and adapted, and has been demonstrated the cross-cultural reliability within Cronbach's alphas: .83, .80, and .82 for the Depression, Anxiety, and Stress subscales, respectively, and .92 for the total DASS total (Chan et al., 2012; Taouk, Lovibond, & Laube, 2001; Wang et al., 2016).

Physical Health

Fatigue was also a predominant health factor in this study suggested by results of qualitative interviews. Occupational Fatigue Exhaustion Recovery (OFER 15) Scale was used in this study to measure the fatigue at work, as this scale comprises three subscales to comprehensively measure fatigue from different aspects, namely chronic fatigue (CF), acute fatigue (AF) and intershift recovery (IR) within 5 items respectively. There are five items for each subscale. Each item is rated on a 7-point Likert scale from 0 (strongly disagree) to 6 (strongly agree). The sum of each subscale is divided by 30 and multiplied

by 100 to produce comparable scores between 0 and 100 (Peter C Winwood, Lushington, & Winefield, 2006). This scale has been tested in different populations, has robust psychometric properties, and is not influenced by gender differences (P C Winwood, Winefield, Dawson, & Lushington, 2005). Cronbach's αs for CF, AF, and IR in this study were 0.81, 0.83, and 0.73, respectively.

Continuous overtime work may induce chronic fatigue while emergent or temporary overtime work usually accompanies with acute fatigue. Moreover, it is an important issue to investigate to which extent workers can recover from work shifts. According to Meijman et al. (1998)'s Effort Recovery model, the possible adverse impacts of overtime work on workers' mental health depend on the quality of recovery during or after work.

7) Work-family Conflict (WFC)

Carlson, Kacmar, and Williams (2000)'s WFC measure was utilized in this study. WFC is a bidirectional construct consisting of wok interfering with family (WIF) and family interfering with work (FIW). Each direction contains three forms, namely time-based, strain-based and behavior-based WFC. Responses were provided on a 5-point scale ranging from 1 (Strongly disagree) to 5 (Strongly agree), with higher scores representing more conflict. In the present study, WIF (three subscales within each three items) was measured (Cronbach's α = 0.75), the reasons for which were discussed in the literature, Chapter 2. Sample items were "The time I must devote to my job keeps me from participating equally in household responsibilities and activities" for time-based WIF, "I am often so emotionally drained when I get home from work that it prevents me from contributing to my family" for strain-based WIF and "Behavior that is effective and necessary for me at work would be counterproductive at home" for behavior-based WIF.

8) Job-related Outcomes

a. Job Satisfaction

This study focuses on employees' overall satisfaction with their job, assessed with the 5-item Job Satisfaction Index developed by Brayfield and Rothe (1951). Participants were asked, for two example items, “I find real enjoyment in my job” and “Most days I am enthusiastic about my work.” Participants rate their level of satisfaction from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate that participants are more satisfied with their present job. Even though this scale was a bit old, it was used in this study as its internal consistency was satisfactory (α = 0.90). In addition, the Chinese version of the scale demonstrated satisfactory internal consistency 0.73, and was negatively correlated with surface acting (Cheung & Tang, 2010). The scale is one of the most cited scales in the job satisfaction field (more than 2500 citations) and is also widely used in the current studies (e.g. Barnes, Miller, & Bostock, 2017; Huang, 2016; Ilies et al., 2017).

b. Turnover Intention

Turnover intention was assessed with a single-item measure validated by Richter (1999): “Since you joined the company, has there ever been a time when you seriously thought about quitting?” The response options were yes, and nothing has improved; yes, but no longer; or no. This item refers to a phenomenon known as “inner resignation”, which is considered to be a highly relevant predictor of a person's intention to leave a company. To obtain a binary variable for the logistic regression analyses, the turnover intention will be dichotomized into Yes (“yes, and nothing has improved”) and No (consisting of “yes, but no longer” and “no”).

c. Work Engagement

Work engagement, a positive work-related state of fulfillment, was measured utilizing Schaufeli, Bakker, and Salanova (2006)’s UWES-9 scale in this study. Three components generated from the scale, namely, vigor, dedication, and absorption, within each three items. All items are scored on a 7-point frequency rating scale ranging from 0 (never) to 6 (always). This scale was considered as a reliable and valid assessment tool and was translated into

various language versions. Cronbach's α of all 9 items varies from 0.85 to 0.94 (median: 0.91) across the 9 national samples. The α-value for the total database is .90 (Schaufeli & Bakker, 2003).

5.2.3 Data Analysis

The quantitative data analysis was conducted via SPSS for Mac version 24. Preliminary analyses were conducted, including assessing missing values and outliers as well as computing variables to get scale scores. There is no missing value in the present dataset. Descriptive statistics were then employed to present the individualistic information and overtime information. Correlation analysis was conducted to assess H1 and H6 (here, ERI is used as a continuous ratio). Independent-samples t-tests and Chi-square test were conducted to test H2, Chi-square for turnover intention and independent-samples t-tests for other dependent variables.

Hierarchical multiple regression analyses were used to assess H2a, H3, H3a, H3b, H3c and H4. In these regression analyses, firstly, ERI was a categorical independent variable, within effort less than or equal to reward which is perceived as adequately rewarded, and effort more than reward (reference group) which is perceived as inadequately rewarded; it compared the differences between adequately rewarded individuals and inadequately rewarded individuals in dependent variables (H2a). Secondly, WTC were investigated through two dimensions separately, namely control over time-off and control over daily hours, which were categorized into low, moderate and high whist using low control as the reference group. It compared the differences between high & moderate control overtime time-off and low control over time-off; high & moderate control over daily hours and low control over daily hours (H3 and H3a). The interaction effect of control over time-off & control over daily hours within gender and dependents status were simultaneously explored (H3b and H3c). Thirdly, the combination effect of ERI and WTC on dependent variables as well as the interaction effect of ERI and

WTC were also investigated (H4). Finally, it investigated the explanatory factors within involuntary (including workload and conformity) and voluntary overtime (including extrinsic motivation and intrinsic motivation) in each dependent variable (H5).

Moreover, bootstrapping mediation analyses were conducted using SPSS version 24 PROCESS plug in to test H7 and H7a, namely two mediation models. A mediator is conceptualised as a variable that accounts for the relationship between a predictor and an outcome. That is to say instead of X directly affecting Y, X is influencing the mediator M, and M is in turn influencing Y. As such the effect of X on Y works through M. The "criteria to establish mediation" approach popularized by Baron and Kenny (1986) is historically important but is outdated and not consistent with modern mediation practice. The statistical significance criteria as described in Baron and Kenny (1986) for the individual paths in a mediation model in order to assess whether a variable M functions as a mediator of the relationship between X and Y was no longer relied on. The pattern of significance or non-significance for individual paths is a medication model is not pertinent to whether the indirect effect is significant. The indirect effect should be estimated (Darlington & Hayes, 2016; Hayes, 2009, 2017). Therefore, mediation effects are identified to be significant when the indirect effect confidence interval (CI) exclude zero.

In order to understand the nature of the mediation effect of M between X and Y, the researchers check for whether the relationship between X and Y is completely or partially accounted for by the mediator. Complete mediation is the case in which the direct effect of X on Y is statistically insignificant after M has been controlled. Partial mediation is the case in which the effect of X on Y is reduced in absolute size but is still statistically significant when the mediator is included (Preacher & Hayes, 2004).

Furthermore, in terms of the effect size, Wen and Fan (2015) questioned Kappa-Squared as the mediation effect size measure as they showed that the

derivation of the maximum possible indirect effect described in the article that introduced Kappa-Squared (Preacher & Kelley, 2011) contains a mathematical error. They claimed that the traditional mediation effect size measure P_M (the ratio of the indirect effect to the total model) seemed to be preferred for basic mediation models. Therefore, the effect size P_M was reported in this research regarding mediation models.

This study assessed the indirect effect of ERI ratio on dependent variables through involuntary overtime and the indirect effect of WTC on dependent variables through voluntary overtime; here, ERI ratio is a continuous variable and WTC is the overall score of control over time-off and control over daily hours. To formally test the mediation effects, 95% confidence intervals and standard errors were computed from 5000 bootstrap samples using Bias corrected bootstrapping (MacKinnon, Lockwood, & Williams, 2004).

Finally, moderation regression analyses were conducted using SPSS PROCESS to test H8, H8a, H8b and H8c. Moderation implies an interaction effect, where introducing a moderating variable (M) changes the direction or magnitude of the relationship between two variables. The moderator explains when an independent variable (X) and a dependent variable (Y) are related. Moderators have been posited to function in one of three mechanisms. A moderation effect may be (a) enhancing, where increasing the moderator would increase the effect of the independent variable on the dependent variable; (b) buffering, where increasing the moderator would decrease the effect of the independent variable on the dependent variable; (c) antagonistic, where increasing the moderator would reverse the effect of the independent variable on the dependent variable (Hayes, 2013).

When there is a significant moderating effect, the direction of the significant interaction effect is tested by means of simple slope analysis. Simple slope analysis is used for the interpretation of the interaction effect when X and M are both continuous. The conditional effect analysis is conducted to

determine the nature of the interaction for low M (i.e. 1 SD below the mean), average M (i.e. at the mean) and high M (i.e. 1 SD above the mean) in conditions of low X (i.e. 1 SD below the mean), average X (i.e. at the mean) and high X (i.e. 1 SD above the mean) in relation to Y. Moreover, the Johnson-Neyman technique (significance region) derives the value along the continuum of M at which the effect of X on Y transitions between statistically significant and not significant at a chosen α-level of significance. These values, if they exist, demarcate the — regions of significance of the effect of X on Y along the continuum of the dimension measured by M (Bauer & Curran, 2005; Hayes & Matthes, 2009).

Logistic regression analysis was conducted to assess turnover intention. The moderation regression analysis was carried out to examine the three moderators outlined below. To avoid potentially problematic high multicollinearity with the interaction, X and M were mean-centered; and the interaction terms between X and Ms were created).

Firstly, in terms of ERI, it assessed whether the interaction term between overtime hours and ERI accounted for a significant proportion of dependent variables; in another word, whether overtime hours had less negative influence on employees within effort less than or equal to reward than employees with effort more than reward. This interaction is the difference in the slopes of overtime hours for the effort more than reward group and effort less than or equal to reward group (H8).

Secondly, in terms of WTC, it explored whether the interaction terms between overtime hours and control over time-off & control over daily hours significantly added to the explanation of dependent variables; in another word, whether the influence of overtime hours had less negative influences on employees with high or moderate control over time-off and control over daily hours than employees with low control over time-off and control over daily hours. The interaction is how overtime hours influence dependent

variables based on the level of control over time-off and control over daily hours (H8a and H8b).

Thirdly, in terms of voluntary overtime: it explored whether the interaction term between overtime hours and voluntary overtime significantly added to the explanation of dependent variables.; in another word, whether the influence of overtime hours had fewer negative influences on employees who were highly voluntarily working overtime than employees who were lowly voluntarily working overtime. The interaction is how overtime hours influence dependent variables based on the level of voluntary overtime (H8c).

5.3 Results

This section was divided into four parts: (1) personal demographics and overtime information; (2) the effects of three influential factors, namely rewards, WTC and involuntary & voluntary overtime on health problems, WFC and job-related outcomes; (3) the mediation effect of involuntary overtime on the association of ERI and dependent variables and the mediation effect of voluntary overtime on the association of WTC and dependent variables; (4) the moderation effect of rewards, WTC and voluntary overtime on the relationships between overtime hours and health problems, WFC and job-related outcomes.

Preliminary analyses were conducted to ensure the data were adequate to every analysis in this study. The database was visually reviewed and presented no missing data.

Power analysis for independent-samples t-tests was conducted in G-POWER to determine a sufficient sample size using two-tailed, an alpha of .05, power of 0.80, a medium effect size 0.5 (Faul, Erdfelder, Lang, & Buchner, 2007). Based on the aforementioned assumptions, the desired sample size is 118. The sample size 265 in this study is enough for the independent-samples

t-tests analysis. In addition, the normality tests were conducted involving all dependent variables (except turnover intention, a dichotomous variable) separated by two groups, namely within compensation for overtime and without compensation for overtime and the results showed that tested variables all met asymptotic normal distribution.

Power analysis for multiple regression was also conducted in G-POWER to determine a sufficient sample size using an alpha of .05, power of 0.80, a medium effect size 0.15 and 13 predictors (the largest number of predictors in this study) (Faul, Erdfelder, Buchner, & Lang, 2009). Based on the aforementioned assumptions, the desired sample size is 131. The sample size 265 in this study is enough for the regression analysis.

Power analysis for mediation regression analysis was conducted in G-POWER to determine a sufficient sample size using an alpha of .05/4, power of 0.80, a medium effect size 0.15 and 2 predictors (Faul et al., 2009). Based on the aforementioned assumptions, the desired sample size is 94. The sample size 265 in this study is enough for the analysis.

Preliminary analyses were conducted to ensure that the data were adequate for regression analysis, including linearity, homogeneity of variance, normality of residuals, independence of errors, multicollinearity, and unusual and influential data. The linearity was tested through the bivariate scatterplot of the predicted value against the standardized residuals. Visual inspection of residual plots from the regression was assessed for homogeneity of variance. The standardized residuals were scattered uniformly and randomly. The normal probability plots of the standardised residuals were generated and inspected. These plots approximated the diagonal line despite some slight deviations. However, these slight deviations were considered acceptable as they were not seriously deviated. The Durbin – Watson test was conducted to assess the independence of errors and indicated a lack of autocorrelation. A

value of 2 means that the residuals are uncorrelated (Field, 2013). The values in this study ranges from 1.82 to 2.25 that are all around 2.

The multicollinearity was checked. The variance inflation factor (VIF) was calculated and reviewed in order to confirm or dismiss any risk of collinearity between predictors. The regression analyses showed VIF values ranging from 1.07 to 5.33, all values below the suggested tolerance threshold of 10 (Field, 2013). The influential data were identified according to standardized residuals (greater than 2 and less than -2), leverage values (greater than $(2k+2)/n$) and Cook's distance ($4/n$). Here k is the number of predictors and n is the number of observations (Belsley, Kuh, & Welsch, 2005; Bollen & Jackman, 1990). The sensitivity tests were conducted to compare whether the influential data excluded and included exert significant influence on the regression models (such as intercept term and significance). The results indicated that even though the outliers affected the values of coefficients, the changes were not significant, and therefore, there was not enough reason to exclude these influential data.

Table 5.2 summarized each hypothesis and indicated whether or not each was supported. The following section reported these results in detail.

Table 5.2 Each Hypothesis and Relevant Result

Hypothesis	Degree of Support and Details
Hypothesis 1. Overtime Hours are positively associated with adverse health problems, WFC and poor job-related outcomes.	Partially supported: overtime hours are correlated with some adverse health problems (chronic fatigue, acute fatigue, recovery) and WFC, but not with depression, anxiety and stress or job-related outcomes (job satisfaction, turnover intention and work engagement).
Hypothesis 2. Individuals receiving compensation for overtime report fewer health problems, less WFC and better job-related outcomes than individuals not receiving	Partially supported: individuals receiving compensation for overtime report fewer stress and recovery than individuals not receiving compensation for overtime, but not reporting fewer depression, anxiety, less WFC or better job-related outcomes

compensation for overtime.	(job satisfaction, turnover intention and work engagement).
Hypothesis 2a. Individuals adequately rewarded report fewer health problems, less WFC and better job-related outcomes than individuals inadequately rewarded.	Nearly fully supported: individuals adequately rewarded report fewer health problems (depression, anxiety, stress, chronic fatigue and acute fatigue), less WFC and better job-related outcomes (job satisfaction, turnover intention and work engagement) than individuals inadequately rewarded, but not reporting better intershift recovery.
Hypothesis 3. Individuals reporting high or moderate control over time-off report fewer health problems, less WFC and better job-related outcomes than individuals participating in low control over time-off.	Fully supported: individuals reporting high or moderate control over time-off report fewer health problems (fewer depression, anxiety, stress, chronic fatigue, acute fatigue and better intershift recovery), less WFC and better job-related outcomes (job satisfaction, turnover intention and work engagement) than individuals participating in low control over time-off.
Hypothesis 3a. Individuals reporting high or moderate control over daily hours report fewer health problems, less WFC and better job-related outcomes than individuals participating in low control over daily hours.	Nearly fully supported: individuals reporting high or moderate control over daily hours report fewer health problems (fewer depression, anxiety, stress, chronic fatigue, acute fatigue and better intershift recovery), less WFC and better job-related outcomes (job satisfaction and work engagement) than individuals participating in low control over daily hours, but not reporting lower turnover intention.
Hypothesis 3b. The interaction effects of control over time-off with gender and dependent status on health problems, WFC and job-related outcomes will be significant; high control over time-off will have greater influence on female and employees who have dependents.	Partially supported: control over time-off has greater influence on female than male in depression, chronic fatigue, acute fatigue, WFC, job satisfaction and turnover intention, but not in anxiety, stress, intershift recovery or work engagement; control over time-off has greater influence on employees who have dependents than those who do not in depression, anxiety and stress, but not in chronic fatigue, acute fatigue, intertshift recovery, WFC or job-related outcomes.
Hypothesis 3c. The interaction effects of control over daily hours with gender and dependent status on health problems, WFC and job-related	Partially supported: control over daily hours have greater influence on female than male in WFC and job satisfaction, but not in mental health problems (depression, anxiety and stress), chronic fatigue, acute

outcomes will be significant; high control over daily hours will have greater influence on female and employees who have dependents.	fatigue, intershift recovery, or turnover intention and work engagement; this research did not find the interaction effects of control over daily hours with dependent status on all dependent variables.
Hypothesis 4. The interaction effect of ERI and WTC significantly adds to the explanation of health problems, WFC and job-related outcomes; adequate reward exerts greater influence on employees with low WTC than on employees with moderate or high WTC.	Partially supported: adequate reward exerts greater influence on employees with low WTC than on employees with moderate or high WTC in anxiety, overall mental health and job satisfaction, but not in depression, stress, chronic fatigue, acute fatigue, intershift recovery, WFC or turnover intention and work engagement.
Hypothesis 5: Involuntary and voluntary overtime (workload, conformity, extrinsic motivation and intrinsic motivation) significantly affect health, WFC and job-related outcomes.	Fully supported: involuntary and voluntary overtime (workload, conformity, extrinsic motivation and intrinsic motivation) significantly affect health (depression, anxiety, stress, chronic fatigue, acute fatigue and intershift recovery), WFC and job-related outcomes (job satisfaction, turnover intention and work engagement).
Hypothesis 6. Voluntary overtime is positively related to WTC and negatively related to ERI; involuntary overtime is positively related to ERI and negatively related to WTC.	Fully supported: voluntary overtime is positively related to WTC and negatively related to ERI; involuntary overtime is positively related to ERI and negatively related to WTC.
Hypothesis 7. Involuntary overtime mediates the effect of ERI on mental health, WFC and job-related outcomes.	Nearly fully supported: involuntary overtime mediates the effect of ERI on mental health (depression, anxiety, stress), chronic fatigue, acute fatigue, WFC, job satisfaction, but not on intershift recovery and work engagement.
H7a. Voluntary overtime mediates the effect of WTC on mental health, WFC and job-related outcomes.	Nearly fully supported: voluntary overtime mediates the effect of WTC on mental health (depression, anxiety, stress), chronic fatigue, acute fatigue, WFC, job satisfaction and work engagement, but not on intershift recovery.
Hypothesis 8. Effort-reward balance buffers the influence of overtime hours on mental health, WFC and job-related outcomes.	Effort-reward balance buffers the influence of overtime hours on job satisfaction, but not on mental health (depression, anxiety, stress), chronic fatigue, acute fatigue, intershift recovery, WFC or turnover intention and work engagement.
Hypothesis 8a. Control over	Partially supported: Control over time-off

time-off buffers the influence of overtime hours on mental health, WFC and job-related outcomes.	buffers the influence of overtime hours on anxiety, stress, acute fatigue, intershift recovery, WFC and job satisfaction, but not on depression, chronic fatigue or turnover intention and work engagement.
Hypothesis 8b. Control over daily hours buffers the influence of overtime hours on mental health, WFC and job-related outcomes.	Partially supported: Control over daily hours buffers the influence of overtime hours on anxiety, stress, WFC and job satisfaction, but not on depression, chronic fatigue, acute fatigue, intershift recovery, or turnover intention and work engagement.
Hypothesis 8c. Voluntary overtime buffers the influence of overtime hours on mental health, WFC and job-related outcomes.	Nearly fully supported: Voluntary overtime buffers the influence of overtime hours on mental health problems (depression, anxiety, stress), chronic fatigue, acute fatigue, intershift recovery, WFC, job satisfaction and work engagement, but not on turnover intention.

5.3.1 Personal Demographics and Overtime Information

5.3.1.1 Personal Demographics

Table 5.3 illustrates the basic personal demographic analysis of Chinese overtime participants, including gender, age, marital status, the situation of dependents, educational level and income level. The sample of overtime employees included 144 male respondents and 121 female participants. The age of participants ranges from 21 to 52 and the majority of participants were in the age group of 21 to 30 years (46.0%) and 31 to 40 years (41.1%).

More than half participants were in the married status and had dependents being taken care of. About two thirds of participants held bachelor's degree and the other held master's degree. Participants' income ranges from 1000 YUAN to 20000 YUAN (*Mdn* = 6000, *interquartile range* = 4000 – 8000).

Table 5.3 Personal Demographics of Participants

	n (Percentages)
Gender	
Male	144 (54.3)
Female	121 (45.7)
Age	
21-30	122 (46.0)
31-40	109 (41.1)
41-50	33 (12.5)
51-60	1 (0.4)
Marital status	
Single	89 (33.6)
Married	157 (59.2)
Cohabiting	14 (5.3)
Divorced	4 (1.5)
Widowed	1 (0.4)
Dependents status	
Yes	151 (57.0)
No	114 (43.0)
Educational attainments	
Bachelor	168 63.4)
Master	97 (36.6)
Income level	
Below 3000	38 (14.3)
3000-5000	88 (33.2)
5001-7000	49 (18.5)
7001-9000	59 (22.3)
Above 9000	31 (11.7)

Table 5.4 illustrates the information of marital status, dependents information, educational level and income level, broken down by gender. Around half of the female participants were married compared to a higher percentage of male participants (66.7%). The proportion of male participants who had dependents was relevantly higher than female participants, 59.7% compared to 53.7%. When comparing the educational attainment of overtime employees, there were minimal differences between the female and male samples. In lower income level, female participants were more than male participants (41.3 % vs. 26.4% at the level of 3000 - 5000) and in higher income level, male participants were more than female participants (18.1% vs.

4.1% at the level of above 9000). Furthermore, the independent-samples t-test was conducted to compare male's income and female's income. On average, male participants' income (M = 6523, SD = 20.69), was significantly higher than female participants' income (M = 5436, SD = 14.37), $t(254.4) = 3.25$, $p = .001$.

Table 5.4 Marital Status and Dependents Information of Female and Male Respondents

	n (Percentages)	
Personal information	Males	Females
Marital status		
Single	35 (24.3)	54 (44.6)
Married	96 (66.7)	61 (50.4)
Cohabiting	10 (6.9)	4 (3.3)
Divorced	2 (1.4)	2 (1.7)
Widowed	1 (0.7)	0 (0)
Dependents information		
Yes	86 (59.7)	65 (53.7)
No	58 (40.3)	56 (46.3)
Educational attainments		
Bachelor	92 (63.9)	76 (62.8)
Master	52 (36.1)	45 (37.2)
Income level		
Below 3000	22 (15.3)	16 (13.2)
3000-5000	38 (26.4)	50 (41.3)
5001-7000	21 (14.6)	28 (23.1)
7001-9000	37 (25.7)	22 (18.2)
Above 9000	26 (18.1)	5 (4.1)

5.3.1.2 Overtime Information

265 (78.9%) participants had overtime experience in the previous six months who completed the full questionnaire. The normality test showed that the overtime hours and overtime days were not normally distributed and after being transformed through arithmetic SQRT, they were asymptotic normally distributed. The overtime hours range from 1 to 28 (*Mdn* = 9.00, *interquartile range* = 4.00 – 14.00) and overtime days ranges from 1 to 30 (*Mdn* = 5.00,

interquartile range = 3.00 – 10.00). Overtime hours and days included overtime work executed at home, but not included commuting time.

Table 5.5 Descriptive Information for Overtime Hours and Overtime Days

Variables	*Mdn*	*IQR*	Percentiles		
			25	50	75
Overtime hours	9.00	10.00	4.00	9.00	14.00
Overtime days	5.00	7.00	3.00	5.00	10.00

Pearson correlation analyses were performed to test Hypothesis 1. The Pearson correlations between transformed overtime hours weekly and outcome variables are presented in Table 5.6. Significant positive correlations were found between overtime hours and chronic fatigue (r = .20, p = .001), acute fatigue (r = .19, p = .003) and significant negative correlation with recovery (r = -.13, p = .036). Overtime hours were also significantly positively correlated with WFC (r = .21, p < .001). According to Field (2009) and Barrett, Morgan, Leech, and Gloeckner (2012), a correlation of between .10 and .29 (in either the positive or negative direction) is considered a weak correlation. Therefore, the above significant correlations are weak correlations.

However, this study did not find significant correlations between overtime hours and depression, anxiety, and stress, or the job-related outcomes, (including job satisfaction, turnover intention, and work engagement). Thus Hypothesis 1 was partially supported: overtime hours are correlated with some adverse health problems (such as chronic fatigue, acute fatigue and recovery) and WFC, but not with depression, anxiety and stress or job-related outcomes.

Table 5.6 Means and Standard Deviations and Correlations of the Measured Variables

	M	*SD*	Cronbach alpha	1	2	3	4	5	6	7	8	9	10	11
1 SQRT Overtime hours	2.93	1.05	--											
2 Depression	8.83	4.79	.91	.12										
3 Anxiety	8.87	4.51	.88	.11	.83***									
4 Stress	9.31	4.30	.87	.10	.79***	.82***								
5 Mental health	27.00	12.72	.95	.12	.94***	.94***	.93***							
6 Chronic fatigue	50.98	22.48	.89	.20**	.61***	.60***	.64***	.66***						
7 Acute fatigue	54.73	22.83	.78	.19**	.47***	.43***	.48***	.49***	.63***					
8 Recovery	50.93	19.65	.77	-.13*	-.15*	-.14*	-.18**	-.16**	-.38***	-.16*				
9 WFC	27.23	8.46	.95	.21***	.48***	.52***	.62***	.57***	.70***	.60***	-.36***			
10 Job satisfaction	14.86	3.72	.80	-.04	-.55***	-.49***	-.54***	-.56***	-.53***	-.50***	.18**	-.48***		
11 Turnover Intention	.64	.48	--	.10	.34***	.36***	.41***	.39***	.34***	.30***	-.13*	.38***	-.45***	
12 Work engagement	26.79	11.80	.95	-.04	-.39***	-.27***	-.29***	-.34***	-.36***	-.37***	.24***	-.26***	.67***	-.27***

*$p < .05$. ** $p < .01$. *** $p < .001$

5.3.2 Reward, WTC and Involuntary and Voluntary Overtime in Relation to Health Problems, WFC and Job-related Outcomes

This section displays the hierarchical regression results of the effects of reward (including compensation for overtime and ERI) (H2 and H2a) and WTC (including control over time-off and control over daily hours) (H3 and H3a) on dependent variables separately; it also shows the interacting effect of control over time-off and control over daily hours with gender and dependents status on dependent variables (H3b and H3c); and the interacting effect of reward and WTC on dependent variables (H4); additionally, it reports the findings of important explanatory factors within involuntary & voluntary overtime sub-dimensions in relation to dependent variables (H5) and the relationships between voluntary and involuntary overtime with ERI and WTC (H6).

5.3.2.1 Reward in relation to Dependent Variables

This section mainly examined the difference between individuals (1) receiving compensation for overtime and not receiving compensation, (2) adequately rewarded and inadequately rewarded, in each dependent variable (Hypothesis 2 and 2a). In general, in terms of reward, the results indicated that individuals not receiving compensation for overtime reported higher stress and lower intershift recovery than individuals receiving compensation for overtime; individuals receiving adequate reward reported less depression, anxiety, stress, overall mental health problems, chronic fatigue, acute fatigue, lower turnover intention, higher job satisfaction and work engagement, whilst ERI significantly added to the explanation of these variables. These are detailed next.

a. Reward Information

Reward was measured in two ways, namely compensation for overtime and Effort-Reward Imbalance (ERI) at work. Results are presented separately in Table 5.7 and Table 5.8.

(1) Compensation for Overtime

More than half (58.1%) of the participants did not receive any compensation for their overtime work. Only 16.6% participants claimed that they received both time and money as compensation. Participants who received money for compensation were more than participants who received time for compensation (17.7% compared to 7.5%).

Table 5.7 Compensation for Overtime Information

Compensation for overtime	*n* (Percentages)
No compensation	154 (58.1)
Yes, compensation in time and money	44 (16.6)
Yes, compensation only in time	20 (7.5)
Yes, compensation only in money	47 (17.7)

(2) Effort-Reward Imbalance (ERI)

Table 5.8 shows that 35.5% participants felt their effort invested was adequately rewarded at work. However, 64.5% participants felt their effort invested at work was not sufficiently rewarded. The Pearson correlation analysis showed that overtime hours were significantly positively related to ERI ratio (r = .14, p = .020), which may suggest that the more overtime hours participants spent at work, the more likely it was that they received imbalanced reward (Beckers et al., 2008).

Table 5.8 Effort-Reward Imbalance Information

Effort-Reward Imbalance (effort/ reward ratio)	*n* (Percentages)
Effort less than reward (ratio ≤1)	94 (35.5)
Effort more than reward (ratio > 1)	171 (64.5)

b. Compensation for Overtime in relation to Dependent Variables

Independent-samples t-tests were conducted to compare dependent variables scores in participants who did not receive compensation for overtime and participants who received compensation for overtime (Hypothesis 2).

Table 5.9 showed that on average, participants who did not receive compensation for overtime experienced significantly higher stress (M = 9.86, SD = 4.14), than participants who received compensation for overtime (M = 8.53, SD = 4.41), $t(263) = 2.52$, $p = .013$, $d = 0.31$, 95% CI [0.29, 2.38]. Participants who did not receive compensation for overtime experienced significantly worse intershift recovery (M = 47.64, SD = 17.61), than participants who received compensation for overtime (M = 53.63, SD = 18.00), $t(263) = -2.71$, $p = .007$, $d = -0.34$, 95% CI [-10.35, -1.63].

There were no significant differences between participants who did not receive compensation for overtime and participants who received compensation for overtime in depression, anxiety, chronic fatigue, acute fatigue, WFC, job satisfaction and work engagement. In addition, a Chi square test was conducted to compare the turnover intention of participants who did not receive compensation for overtime and participants who received compensation for overtime, and it showed that there was no significant difference of turnover intention, $\chi^2 (1) = 3.50$, $p = .061$. Therefore, Hypothesis 2 is partially supported: individuals receiving compensation for overtime report fewer stress and better intershift recovery but not fewer depression, anxiety, chronic fatigue, acute fatigue, WFC, job satisfaction, turnover intention and work engagement.

Table 5.9 Comparison of Without Overtime Compensation and Within Overtime Compensation in Mental and Physical Heath, WFC and Job-related Outcomes

	Without		Within				95% CI		Cohen's
Variable	*M*	*SD*	*M*	*SD*	*t*(263)	*p*	*LL*	*UL*	*d*
Depression	8.97	4.64	8.63	5.00	0.58	.565	-0.83	1.52	0.07
Anxiety	9.22	4.29	8.38	4.78	1.50	.134	-0.26	1.95	0.18
Stress	9.86	4.14	8.53	4.41	2.52	.013	0.29	2.38	0.31
Mental health	28.06	12.28	25.54	13.23	1.59	.112	-0.59	5.63	0.20
Chronic fatigue	51.30	22.70	50.54	22.27	0.27	.787	-4.76	6.28	0.03
Acute fatigue	54.68	19.51	52.31	18.87	0.99	.325	-2.36	7.08	0.12
Intershift recovery	47.64	17.61	53.63	18.00	-2.71	.007	-10.35	-1.63	-0.34
WFC	27.83	8.16	26.40	8.84	1.36	.174	-0.64	3.51	0.17
Job satisfaction	14.71	3.56	15.07	3.94	-0.79	.432	-1.28	0.55	-0.10
Work engagement	26.73	12.61	26.87	10.64	-0.10	.924	-3.04	2.76	-0.01

Note. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

c. ERI in relation to Health Problems, WFC and Job-related Outcomes

The Pearson correlation analysis showed the ERI ratio was significantly associated with depression (r = .39, p < .001), anxiety (r = .37, p < .001), stress (r = .40, p < .001), overall mental health (r = .41, p < .001), chronic fatigue (r = .39, p < .001), acute fatigue (r = .49, p < .001), intershifit recovery (r = -.16, p = .011), WFC (r = .35, p < .001), job satisfaction (r = -.65, p < .001), turnover intention (r = .31, p < .001) and work engagement (r = -.42, p < .001).

Furthermore, hierarchical regression analyses were conducted to investigate the relationship between ERI (a dichotomous variable, effort more than reward and effort less than or equal to reward) and dependent variables after controlling potential personal characteristics and to compare the difference between adequate reward and inadequate reward in each dependent variable (Hypothesis 2a).

Table 5.10 showed that after controlling potential influential personal characteristics, ERI statistically significantly added to the explanation of depression, R^2 = .099, Δ R^2 = .038, F(1, 256) = 10.71, p = .001, 95% CI [-3.16, -0.79]; anxiety, R^2 = .128, Δ R^2 = .036, F(1, 256) = 8.40, p = .004, 95% CI [-2.76, -0.53]; stress, R^2 = .132, Δ R^2 = .069, F(1, 256) = 20.34, p < .001, 95% CI [-3.42, -1.34]; overall mental health, R^2 = .125, Δ R^2 = .046, F(1, 256) = 13.47, p < .001, 95% CI [-8.91, -2.69]; chronic fatigue, R^2 = .092, Δ R^2 = .060, F(1, 256) = 16.82, p < .001, 95% CI [-17.26, -6.06]; acute fatigue, R^2 = .120, Δ R^2 = .067, F(1, 254) = 19.51, p < .001, 95% CI [-15.31, -5.87]; WFC, R^2 = .150, Δ R^2 = .047, F(1, 256) = 14.10, p < .001, 95% CI [-5.93, -1.85]; job satisfaction, R^2 = .174, Δ R^2 = .147, F(1, 256) = 45.51, p < .001, 95% CI [2.14, 3.91]; and work engagement, R^2 = .077, Δ R^2 = .049, F(1, 256) = 13.61, p < .001, 95% CI [2.59, 8.51]. Interestingly, ERI accounted for 14.7% variance in the report of job satisfaction. However, ERI did not statistically significantly add to the explanation of intershift recovery.

Additionally, binary logistic regression was conducted to investigate the effect of ERI on turnover intention and the results showed that after controlling potential personal characteristics, ERI significantly added to the explanation of turnover intention, R^2 = .149, Δ R^2 = .060, *OR* = 0.37, $p < .001$, 95% CI [0.21, 0.64].

Furthermore, participants who were adequately rewarded experienced significantly less depression than participants who were inadequately rewarded, $t(256) = -3.27$, $p = .001$; less anxiety, $t(256) = -2.90$, $p = .004$; less stress, $t(256) = -4.51$, $p < .001$; less overall mental health problems, $t(256) = -3.67$, $p < .001$; less chronic fatigue, $t(256) = -4.10$, $p < .001$; less acute fatigue, $t(256) = -4.42$, $p < .001$; less WFC, $t(256) = -3.76$ $p < .001$; higher job satisfaction, $t(256) = 6.75$, $p < .001$; and higher work engagement, $t(256) = 3.69$, $p < .001$. A chi square test was conducted to compare the turnover intention of participants who were adequately rewarded and participants who were not adequately rewarded and it showed that there was a significant difference of turnover intention, $\chi^2(1) = 14.66$, $p < .001$. Overall, Hypothesis 2a was supported to a large extent: individuals adequately rewarded reported fewer health problems (except intershift recovery), less WFC and better related outcomes than individuals inadequately rewarded.

Table 5.10 Hierarchical Multiple Regression Analyses Explaining Mental and Physical Health, WFC and Job-related Outcomes From ERI

Outcome Variable	Predictor	R^2	Δ R^2	β	*t*	*F*	Δ *F*	95 % CI
Depression	Step 1	.061				2.39*		[7.56, 14.93]
	Control variables[a]							
	Step 2	.099	.038**			3.51**	10.71**	[7.51, 14.73]
	ERI			-.20**	-3.27**			[-3.16, -0.79]
Anxiety	Step 1	.075				2.99**		[10.40, 17.36]
	Control variables[a]							
	Step 2	.105	.029**			3.74***	8.40**	[10.36, 17.19]
	ERI			-.17**	-2.90**			[-2.76, -0.53]
Stress	Step 1	.063				2.87*		[9.77, 16.48]
	Control variables[a]							
	Step 2	.132	.069***			5.55***	20.34***	[9.80, 16.28]
	ERI			-.27***	-4.51***			[-3.42, -1.34]
Mental health	Step 1	.079				3.16**		[29.04, 48.46]
	Control variables[a]							
	Step 2	.125	.046***			4.58***	13.47***	[28.93, 47.84]
	ERI			-.22***	-3.67***			[-8.91, -2.69]
Chronic fatigue	Step 1	.032				1.23		[40.85, 76.79]
	Control variables[a]							
	Step 2	.092	.060***			3.24**	16.82***	[40.68, 75.57]
	ERI			-.25***	-4.10***			[-17.26, -6.06]
Acute fatigue	Step 1	.052				2.03		[55.21, 85.11]
	Control variables[a]							

	Step 2	.120	.067***			4.35***	19.51***	[55.02, 83.87]
	ERI			-.26***	-4.42***			[-15.31, -5.87]
Intershift recovery	Step 1	.030				1.14		[26.83, 55.46]
	Control variables[a]							
	Step 2	.041	.011			1.37	2.87	[27.18, 55.71]
	ERI			.11	1.69			[-0.64, 8.50]
WFC	Step 1	.103				4.21***		[27.84, 40.87]
	Control variables[a]							
	Step 2	.150	.047***			5.63***	14.10***	[27.76, 40.48]
	ERI			-.22***	-3.76***			[-5.93, -1.85]
Job satisfaction	Step 1	.028				1.04		[10.69, 16.65]
	Control variables[a]							
	Step 2	.174	.147***			6.76***	45.51***	[11.10, 16.60]
	ERI			.39***	6.75***			[2.14, 3.91]
Work engagement	Step 1	.028				1.08		[18.54, 37.45]
	Control variables[a]							
	Step 2	.077	.049***			2.69**	13.61***	[19.09, 37.56]
	ERI			.23***	3.69***			[2.59, 8.51]

Note. CI = confidence interval.

[a] Control variables included gender, age, marital status, dependents status, education level and income.

*$p < .05$. ** $p < .01$. *** $p < .001$.

5.3.2.2 WTC in relation to Health Problems, WFC and Job-related Outcomes

In this section, hierarchical regression analyses were conducted to investigate the influence of WTC (including two sub-dimensions, namely control over time-off and control over daily hours) on three categories of dependent variables that are mental and physical health, WFC and job-related outcomes after controlling potential personal characteristics. It compared the difference of scores of dependent variables between individuals participating in high or moderate control over time-off and individuals participating in low control over time-off (Hypothesis 3), as such for control over daily hours (Hypothesis 3a). In addition, it also explored whether the interaction effect of control over time-off and control over daily hours with gender and dependents status significantly added to the explanation of dependent variables (Hypothesis 3b and 3c).

a. WTC Information

The majority of participants reported they can schedule their overtime in advance most time or sometimes, 30.6% and 29.8% respectively. Less than one fifth of participants (14.0%) can always have the control over overtime and around one quarter of participants were rarely or never able to schedule their overtime in advance.

Table 5.11 Overtime Control Information

Overtime control	*n* (Percentages)
Never	14 (5.3)
Rarely	54 (20.4)
Sometimes	79 (29.8)
Most time	81 (30.6)
All the time	37 (14.0)

Table 5.12 shows on average, how many participants were able to influence their working times, including control over time-off, control over daily hours and overall WTC in the levels of low, moderate and high. Nearly half of the participants had autonomy on moderate control over time-off (42.3%), daily

hours (49.8%) and overall WTC (47.5%) and around a quarter of participants had low control over time off, control over daily hours and overall WTC, at the same time the other quarter of participants having high control.

Table 5.12 WTC Information

	n (Percentages)		
WTC	Low	Moderate	High
Control over time-off	74 (27.9)	112 (42.3)	79 (29.8)
Control over daily hours	79 (29.8)	132 (49.8)	54 (20.4)
Overall WTC	72 (27.2)	126 (47.5)	67 (25.3)

b. Control over Time-off in relation to Health Problems, WFC and Job-related Outcomes

In general, control over time-off significantly added to the explanation of depression, anxiety, stress, overall mental health problems, chronic fatigue, acute fatigue, intershift recovery, WFC, job satisfaction and work engagement. Overtime employees who had high or moderate control over time-off had significantly less depression, anxiety, stress, overall mental health problems, WFC, and higher intershift recovery, job satisfaction and work engagement than overtime employees who had low control over time-off. Additionally, the significant difference in turnover intention was only found between high control over time-off and low control over time-off. Overall, Hypothesis 3 was fully supported within all dependent variables.

In addition, in terms of the interaction effect of control over time-off with gender and dependents, high control over time-off had significant influence on female than male in depression, chronic fatigue, acute fatigue, WFC, job satisfaction and turnover intention. Moderate or high control over time-off had significant influence on overtime employees who had dependents than overtime employees who did not have dependents in depression, anxiety and stress. The Hypothesis 3b was partially supported. The following section reports these results in detail.

Hierarchical regression analyses were conducted. Potential influential personal variables were controlled and entered in step 1. Next, the categorical variable, control over time-off was entered in step 2; low control over time-off was the reference group. Finally, the interactions between control over time-off with gender and dependents status were entered in step 3.

Table 5.13 indicated that after controlling potential influential personal characteristics, control over time-off statistically added to the explanation of depression, R^2 = .085, Δ R^2 = .023, F(2, 255) = 3.24, p = .041, 95% CI [8.64, 16.41]. Participants who had moderate control over time-off or high control over time-off experienced significantly less depression than participants who had low control over time-off, t(255) = -2.34, p = .020 and t(255) = -2.15, p = .033 respectively. The interaction effect of control over time-off with gender and dependents added to this explanation, R^2 = .130, Δ R^2 = .046, F(4, 251) = 3.31, p = .012, 95% CI [6.32, 14.48]. Most important, compared to low control over time-off, high control over time-off had significantly greater influence on female than male in depression, t(251) = -2.89, p = .004 and compared to low control over time-off, moderate control over time-off had significantly greater influence on participants within dependents than participants without dependents in depression, t(251) = -2.04, p = .042.

After controlling potential influential personal characteristics, control over time-off statistically added to the explanation of anxiety, R^2 = .116, Δ R^2 = .041, F(2, 255) = 5.86, p = .003, 95% CI [11.80, 19.00]. Participants who had moderate control over time-off or high control over time-off experienced significantly less anxiety than participants who had low control over time-off, t(255) = -2.79, p = .006 and t(255) = -3.21, p = .002 respectively. The interaction effect of control over time-off with dependents added to this explanation, R^2 = .155, Δ R^2 = .039, F(4, 251) = 2.88, p = .023, 95% CI [9.66, 17.25]. Most important, compared to low control over time-off, high control over time-off and moderate control over time-off had significantly greater

influence on participants within dependents than participants without dependents in anxiety, $t(251) = -3.20$, $p = .002$ and $t(251) = -2.07$, $p = .040$ respectively. However, the interaction effect of control over time-off with gender was not significant for anxiety.

After controlling potential influential personal characteristics, control over time-off statistically added to the explanation of stress, $R^2 = .136$, $\Delta R^2 = .049$, $F(2, 255) = 7.20$, $p = .001$, 95% CI [11.51, 18.28]. Participants who had moderate control over time-off or high control over time-off experienced significantly less stress than participants who had low control over time-off, $t(255) = -2.43$, $p = .016$ and $t(255) = -3.78$, $p < .001$ respectively. The interaction effect of control over time-off with dependents added to this explanation, $R^2 = .180$, $\Delta R^2 = .044$, $F(4, 251) = 3.35$, $p = .011$, 95% CI [9.01, 16.13]. Most important, compared to low control over time-off, high control over time-off and moderate control over time-off had significantly greater influence on participants within dependents than participants without dependents in terms of stress, $t(251) = -2.75$, $p = .006$ and $t(251) = -2.66$, $p = .008$ respectively. However, the interaction effect of control over time-off with gender was not significant in terms of stress.

After controlling potential influential personal characteristics, control over time-off statistically added to the explanation of overall mental health, $R^2 = .119$, $\Delta R^2 = .040$, $F(2, 255) = 5.79$, $p = .003$, 95% CI [32.70, 52.94]. Participants who had moderate control over time-off or high control over time-off experienced significantly fewer mental health problems than participants who had low control over time-off, $t(255) = -2.70$, $p = .007$ and $t(255) = -3.23$, $p = .001$ respectively. The interaction effect of control over time-off with gender and dependents added to this explanation, $R^2 = .160$, $\Delta R^2 = .040$, $F(4, 251) = 3.02$, $p = .019$, 95% CI [25.76, 47.09]. Most important, compared to low control over time-off, high control over time-off had significantly greater influence on females than males in terms of mental health, $t(251) = -2.00$, $p = .046$, and compared to low control over time-off,

moderate control over time-off had significantly greater influence on participants with dependents than participants without dependents in mental health, $t(251) = -2.84$, $p = .005$.

Table 5.13 Hierarchical Multiple Regression Analysis Explaining Mental Health Variables from Control over Time-off

	Depression		Anxiety		Stress		Overall mental health	
Predictor	Δ R^2	β	Δ R^2	β	Δ R^2	β	Δ R^2	β
Step 1	061*		.075**		.087**		.079**	
Control variables[a]								
Step 2	.023*		.041**		.049**		.040**	
MCT vs. LCT		-.17*		-.20**		-.17*		-.19**
HCT vs. LCT		-.16*		-.23**		-.27***		-.23**
Step 3	.046*		.039*		.044*		.040*	
MCT × G		-.23		-.17		-.12		-.19
HCT × G		-.31**		-.08		-.20		-.21*
MCT × D		-.26*		-.40**		-.34**		-.36**
HCT × D		-.02		-.24*		-.30		-.20
Total R^2	.130**		.155***		.180***		.160***	

Note. CI = confidence interval. HCT= high control over time-off. MCT= moderate control over time-off. LCT= low control over time-off. G = gender. D = dependents status.

[a] Control variables included gender, age, marital status, dependents status, education level and income.

*p < .05. ** p < .01. *** p < .001.

Table 5.14 indicates that after controlling potential influential personal characteristics, control over time-off statistically added to the explanation of chronic fatigue, R^2 = .123, Δ R^2 = .091, F(2, 255) = 13.24, p < .001, 95% CI [52.20, 87.89]. Participants who had moderate control over time-off or high control over time-off experienced significantly less chronic fatigue than participants who had low control over time-off, t(255) = -4.13, p < .001 and t(255) = -4.86, p < .001 respectively. The interaction effect of control over time-off with gender and dependents added to this explanation, R^2 = .162, Δ R^2 = .038, F(4, 251) = 2.86, p = .024, 95% CI [44.44, 82.10]. Most important, compared to low control over time-off, high control over time-off had significantly greater influence on female than male in chronic fatigue, t(251) = -2.92, p = .004. However, the interaction effect of control over time-off with dependents status was not significant in terms of chronic fatigue.

After controlling potential influential personal characteristics, control over time-off statistically added to the explanation of acute fatigue, R^2 = .199, Δ R^2 = .147, F(2, 255) = 23.39, p < .001, 95% CI [62.02, 91.21]. Participants who had moderate control over time-off or high control over time-off experienced significantly less acute fatigue than participants who had low control over time-off, t(255) = -4.01, p < .001 and t(255) = -6.84, p < .001 respectively. The interaction effect of control over time-off with gender and dependents added to this explanation, R^2 = .265, Δ R^2 = .066, F(4, 251) = 5.63 p < .001, 95% CI [51.90, 82.07] which was mainly contributed by the interaction between high control over time-off and gender. Compared to low control over time-off, high control over time-off had significantly greater influence on female than male in acute fatigue, t(251) = -3.91, p < .001. The interaction effect of control over time-off with dependents status was not significant.

After controlling potential influential personal characteristics, control over time-off statistically added to the explanation of recovery, R^2 = .070, Δ R^2 = .043, F(2, 255) = 5.84, p = .003, 95% CI [22.71, 52.13]. Participants who had moderate control over time-off or high control over time-off experienced

significantly higher recovery than participants who had low control over time-off, $t(255) = 2.26$, $p = .025$ and $t(255) = 3.39$, $p = .001$ respectively. The interaction effect of control over time-off with gender and dependents did not significantly add to this explanation, $R^2 = .086$, $\Delta R^2 = .016$, $F(4, 251) = 1.12$, $p = .348$, 95% CI [26.59, 58.05].

Table 5.14 Hierarchical Multiple Regression Analysis Explaining Chronic Fatigue, Acute Fatigue and Recovery From Control over Time-off

	Chronic Fatigue		Acute Fatigue		Recovery	
Predictor	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	.032		.052		.027	
Control variables[a]						
Step 2	.091***		.147***		.043**	
MCT vs. LCT		-.30***		-.27***		.17*
HCT vs. LCT		-.35***		-.47***		.25**
Step 3	.038*		.066***		.016	
MCT × G		-.04		-.02		.11
HCT × G		-.31**		-.39***		.22
MCT × D		-.07		-.14		.05
HCT × D		-.05		-.10		.07
Total R^2	.162***		.265***		.086*	

Note. CI = confidence interval. HCT= high control over time-off. MCT= moderate control over time-off. LCT= low control over time-off. G = gender. D = dependents status.

[a] Control variables included gender, age, marital status, dependents status, education level and income.

*$p < .05$. ** $p < .01$. *** $p < .001$.

Table 5.15 indicated that after controlling potential influential personal characteristics, control over time-off statistically added to the explanation of WFC, $R^2 = .230$, $\Delta R^2 = .128$, $F(2, 255) = 21.15$, $p < .001$, 95% CI [32.78, 45.37]. Participants who had moderate control over time-off or high control over time-off experienced significantly less WFC than participants who had low control over time-off, $t(255) = -4.81$, $p < .001$ and $t(255) = -6.32$, $p < .001$ respectively. The interaction effect of control over time-off with gender and dependents added to this explanation, $R^2 = .288$, $\Delta R^2 = .057$, $F(4, 251) = 5.06$, $p = .001$, 95% CI [28.94, 42.01] which was mainly contributed by the

interaction between high control over time-off and gender. Compared to low control over time-off, high control over time-off had significantly greater influence on female than male in WFC, $t(251) = -3.66$, $p < .001$. The interaction effect of control over time-off with dependents status was not significant in WFC.

After controlling potential influential personal characteristics, control over time-off statistically added to the explanation of job satisfaction, $R^2 = .119$, $\Delta R^2 = .092$, $F(2, 255) = 13.29$, $p < .001$, 95% CI [8.91, 14.83]. Participants who had moderate control over time-off or high control over time-off experienced significantly higher job satisfaction than participants who had low control over time-off, $t(255) = 3.93$, $p < .001$ and $t(255) = 4.97$, $p < .001$ respectively. The interaction effect of control over time-off with gender and dependents added to this explanation, $R^2 = .181$, $\Delta R^2 = .062$, $F(4, 251) = 4.72$, $p = .001$, 95% CI [10.84, 17.00], which was mainly contributed by the interaction between high control over time-off and gender. Compared to low control over time-off, high control over time-off had significantly greater influence on female than male in job satisfaction, $t(251) = 3.84$, $p < .001$. The interaction effect of control over time-off with dependents status was not significant in terms of job satisfaction.

After controlling potential influential personal characteristics, control over time-off statistically added to the explanation of work engagement, $R^2 = .077$, $\Delta R^2 = .048$, $F(2, 255) = 6.68$, $p = .001$, 95% CI [14.33, 33.56]. Participants who had moderate control over time-off or high control over time-off experienced significant higher work engagement than participants who had low control over time-off, $t(255) = 2.70$, $p = .007$ and $t(255) = 3.56$, $p < .001$ respectively. The interaction effect of control over time-off with gender and dependents status was not significant in terms of work engagement.

The binary logistic regression analysis was conducted to investigate the effect of control over time off on turnover intention (a binary variable). After

controlling potential personal characteristics, control over time-off did not statistically significantly add to the explanation of turnover intention, R^2 = .116, Δ R^2 = .027, χ^2 (2) = 5.66, p = .059. However, participants who had high control over time-off reported significant lower turnover intention than participants who had low control over time-off, B = -.80, p = .026, whereas the difference is not significant between moderate control over time-off and high low control over time-off, B = -.23, p = .507. The interaction effect of control over time-off with gender and dependents added to this explanation, R^2 = .164, Δ R^2 = .048, χ^2 (4) = 10.21, p = .037, which was mainly contributed by the interaction between high control over time-off and gender, OR = 0.18, p = .021, 95% CI [0.04, 0.78]. Compared to low control over time-off, female within high control over time-off had significantly lower turnover intention than male within high control overtime time-off.

Table 5.15 Hierarchical Multiple Regression Analysis Explaining WFC, Job satisfaction and Work Engagement From Control over Time-off

	WFC		Job satisfaction		Work engagement	
Predictor	Δ R^2	β	Δ R^2	β	Δ R^2	β
Step 1	.103***		.028		.028	
Control variables[a]						
Step 2	.128***		.092***		.048**	
MCT vs. LCT		-.32***		.28***		.20**
HCT vs. LCT		-.42***		.36***		.26***
Step 3	.057**		.062**		.018	
MCT × G		-.01		.15		.17
HCT × G		-.36***		.40***		.22
MCT × D		-.03		.14		.12
HCT × D		-.13		.17		.09
Total R^2	.288***		.181***		.095*	

Note. CI = confidence interval. HCT= high control over time-off. MCT= moderate control over time-off. LCT= low control over time-off. G = gender. D = dependents status.

[a] Control variables included gender, age, marital status, dependents status, education level and income.

*p < .05. ** p < .01. *** p < .001.

c. Control over Daily Hours in relation to Health Problems, WFC and Job-related Outcomes

In general, control over daily hours significantly added to the explanation of depression, anxiety, stress, overall mental health problems, chronic fatigue, acute fatigue, intershift recovery, WFC, job satisfaction and work engagement. Overtime employees who had high or moderate control over daily hours had significantly less depression, anxiety, stress, overall mental health problems, chronic fatigue, acute fatigue, WFC, and higher intershift recovery, job satisfaction and work engagement than overtime employees who had low control over daily hours. This study did not find the explanation effect of control over daily hours on turnover intention or a significant difference between high or moderate control over daily hours and low control over daily hours in terms of turnover intention. Therefore, the Hypothesis 3a was supported to a large extent: individuals participating in high or moderate control over daily hours report fewer health problems, less WFC and better job-related outcomes (except turnover intention).

In addition, in terms of the interaction effect of control over daily hours with gender and dependents, high control over daily hours had significant influence on female than male in WFC and job satisfaction. This study did not find the interaction effect of control over daily hours with dependents status in all dependent variables investigated in this current research. Hypothesis 3c was partially supported. The following section reports these results in detail.

The same process was conducted for control over daily hours as control over time-off. Table 5.16 showed that after controlling potential influential personal characteristics, control over daily hours statistically added to the explanation of depression, R^2 = .090, Δ R^2 = .029, F(2, 255) = 4.07, p = .018, 95% CI [8.61, 16.24]. This contribution was mainly contributed by moderate control over daily hours. Participants who had moderate control over daily hours experienced significantly less depression than participants who had low control over daily hours, t(255) = -2.81, p = .005. The results did not indicate

the significant difference between high control over daily hours and low control over daily hours in depression, $t(255) = -1.87$, $p = .063$, and the interaction effect of control over daily hours with gender and dependents, $R^2 = .104$, $\Delta R^2 = .013$, $F(4, 251) = 0.93$, $p = .447$, 95% CI [7.77, 16.05].

After controlling potential influential personal characteristics, control over daily hours statistically added to the explanation of anxiety, $R^2 = .103$, $\Delta R^2 = .027$, $F(2, 255) = 3.87$, $p = .022$, 95% CI [11.42, 18.58]. This contribution was mainly contributed by moderate control over daily hours. Participants who had moderate control over daily hours experienced significantly less anxiety than participants who had low control over daily hours, $t(255) = -2.73$, $p = .007$. The results did not indicate the significant difference between high control over daily hours and low control over daily hours in anxiety, $t(255) = -1.86$, $p = .065$, and the interaction effect of control over daily hours with gender and dependents, $R^2 = .117$, $\Delta R^2 = .015$, $F(4, 251) = 1.05$, $p = .383$, 95% CI [10.18, 17.94].

After controlling potential influential personal characteristics, control over daily hours statistically added to the explanation of stress, $R^2 = .132$, $\Delta R^2 = .045$, $F(2, 255) = 6.62$, $p = .002$, 95% CI [11.59, 18.28]. Participants who had moderate control over daily hours or high control over daily hours experienced significantly less stress than participants who had low control over daily hours, $t(255) = -3.43$, $p = .001$ and $t(255) = -2.80$, $p = .005$ respectively. The results did not indicate the interaction effect of control over daily hours with gender and dependents in stress, $R^2 = .147$, $\Delta R^2 = .016$, $F(4, 251) = 1.14$, $p = .336$, 95% CI [10.44, 17.70].

After controlling potential influential personal characteristics, control over daily hours statistically added to the explanation of overall mental health, $R^2 = .117$, $\Delta R^2 = .038$, $F(2, 255) = 5.42$, $p = .005$, 95% CI [32.35, 52.36]. Participants who had moderate control over daily hours or high control over daily hours experienced significantly less mental health problems than

participants who had low control over daily hours, $t(255) = -3.20$, $p = .002$ and $t(255) = -2.32$, $p = .021$ respectively. The interaction effect of control over daily hours with gender and dependents did not add to this explanation, $R^2 = .131$, $\Delta R^2 = .014$, $F(4, 251) = 1.01$, $p = .401$, 95% CI [29.20, 50.88].

Table 5.16 Hierarchical Multiple Regression Analysis Explaining Mental Health Variables from Control over Daily Hours

	Depression		Anxiety		Stress		Overall mental health	
Predictor	Δ R^2	β	Δ R^2	β	Δ R^2	β	Δ R^2	β
Step 1	.061*		.075		.087**		.079**	
Control variables[a]								
Step 2	.029*		.027*		.045**		.038**	
MCD vs. LCD		-.20**		-.19**		-.23**		-.22**
HCD vs. LCD		-.13		-.13		-.19**		-.16*
Step 3	.013		.015		.016		.014	
MCD × G		-.02		-.004		-.11		-.05
HCD × G		-.16		-.06		-.17		-.14
MCD × D		-.02		-.17		-.04		-.08
HCD × D		-.11		-.21		-.15		-.17
Total R^2	.104**		.117**		.147***		.131**	

Note. CI = confidence interval. HCD = high control over daily hours. MCD = moderate control over daily hours. LCD = low control over daily hours. G = gender. D = dependents status.

[a] Control variables included gender, age, marital status, dependents status, education level and income.

*p < .05. ** p < .01. *** p < .001.

Table 5.17 displayed that controlling potential influential personal characteristics, control over daily hours statistically added to the explanation of chronic fatigue, R^2 = .105, Δ R^2 = .072, F(2, 255) = 10.29, p < .001, 95% CI [50.07, 85.67]. Participants who had moderate control over daily hours or high control over daily hours experienced significantly less chronic fatigue than participants who had low control over daily hours, t(255) = -4.46, p < .001 and t(255) = -2.98, p = .003 respectively. The interaction effect of control over daily hours with gender and dependents did not add to this explanation, R^2 = .117, Δ R^2 = .012, F(4, 251) = 0.85 p = .494, 95% CI [43.79, 82.41].

After controlling potential influential personal characteristics, control over daily hours statistically added to the explanation of acute fatigue, R^2 = .179, Δ R^2 = .127, F(2, 255) = 19.73, p < .001, 95% CI [62.36, 91.53]. Participants who had moderate control over daily hours or high control over daily hours experienced significantly less acute fatigue than participants who had low control over daily hours, t(255) = -5.46, p < .001 and t(255) = -5.46, p < .001 respectively. The interaction effect of control over daily hours with gender and dependents did not add to this explanation, R^2 = .186, Δ R^2 = .006, F(4, 251) = 0.48, p = .749, 95% CI [57.40, 89.14].

After controlling potential influential personal characteristics, control over daily hours statistically added to the explanation of recovery, R^2 = .103, Δ R^2 = .027, F(2, 255) = 3.87, p = .022, 95% CI [11.42, 18.58]. This contribution was mainly contributed by moderate control over daily hours. Participants who had moderate control over daily hours experienced significantly higher recovery than participants who had low control over daily hours, t(255) = 2.79, p = .006. The results did not indicate the significant difference between high control over daily hours and low control over daily hours in recovery, t(255) = 1.60, p = .111, and the interaction effect of control over daily hours with gender and dependents, R^2 = .067, Δ R^2 = .011, F(4, 251) = 0.74, p = .568, 95% CI [24.63, 56.39].

Table 5.17 Hierarchical Multiple Regression Analysis Explaining Chronic Fatigue, Acute Fatigue and Recovery From Control over Daily Hours

	Chronic Fatigue		Acute Fatigue		Recovery	
Predictor	Δ R^2	β	Δ R^2	β	Δ R^2	β
Step 1	.032		.052		.027	
Control variables[a]						
Step 2	.072***		.127***		.029*	
MCD vs. LCD		-.31***		-.36***		.20**
HCD vs. LCD		-.21**		-.37***		.11
Step 3	.012		.006		.011	
MCD × G		-.11		-.14		.13
HCD × G		-.18		-.10		-.02
MCD × D		-.08		-.07		-.01
HCD × D		-.05		-.01		.08
Total R^2	.117**		.186***		.067	

Note. CI = confidence interval. HCD = high control over daily hours. MCD = moderate control over daily hours. LCD = low control over daily hours. G = gender. D = dependents status.

[a] Control variables included gender, age, marital status, dependents status, education level and income.

*p < .05. ** p < .01. *** p < .001.

Table 5.18 showed that after controlling potential influential personal characteristics, control over daily hours statistically added to the explanation of WFC, R^2 = .230, Δ R^2 = .128, F(2, 255) = 21.15, p < .001, 95% CI [32.78, 45.37]. Participants who had moderate control over daily hours or high control over daily hours experienced significantly less WFC than participants who had low control over daily hours, t(255) = -4.81, p < .001 and t(255) = -6.32, p < .001 respectively. The interaction effect of control over daily hours with gender and dependents added to this explanation, R^2 = .288, Δ R^2 = .057, F(4, 251) = 5.06, p = .001, 95% CI [28.94, 42.01], which was mainly contributed by the interaction between high control over daily hours and gender. Compared to low control over daily hours, high control over daily hours had significantly greater influence on female than male in WFC, t(251) = -3.66, p < .001. The interaction effect of control over time-off with dependents status was not significant in WFC.

After controlling potential influential personal characteristics, control over daily hours statistically added to the explanation of job satisfaction, R^2 = .135, Δ R^2 = .107, F(2, 255) = 15.78, p < .001, 95% CI [8.99,14.77]. Participants who had moderate control over daily hours or high control over daily hours experienced significantly higher job satisfaction than participants who had low control over daily hours, t(255) = 4.91, p < .001 and t(255) = 4.86, p < .001 respectively. The interaction effect of control over daily hours with gender and dependents did not add to this explanation, R^2 = .152, Δ R^2 = .017, F(4, 251) = 1.29, p = .275, 95% CI [9.15, 15.41]. However, compared to low control over daily hours, high control over daily hours had significant greater influence on female than male in job satisfaction, t(251) = 2.16, p = .032.

After controlling potential influential personal characteristics, control over daily hours statistically added to the explanation of work engagement, R^2 = .086, Δ R^2 = .058, F(2, 255) = 8.07, p < .001, 95% CI [14.45, 33.33]. Participants who had moderate control over daily hours or high control over daily hours experienced significantly higher work engagement than participants who had low control over daily hours, t(255) = 3.37, p = .001 and t(255) = 3.60, p < .001 respectively. The interaction effect of control over daily hours with gender and dependents did not add to this explanation, R^2 = .090, Δ R^2 = .003, F(4, 251) = 0.23, p = .923, 95% CI [14.85, 35.43].

The binary logistic regression analysis was conducted to investigate the effect of control over daily hours on turnover intention. After controlling potential personal characteristics, control over daily hours did not statistically significantly add to the explanation of turnover intention, R^2 = .102 Δ R^2 = .013, χ^2 (2) = 2.67, p = .264. The interaction effect of control over daily hours with gender and dependents did not significantly add to this explanation, R^2 = .129, Δ R^2 = .027, χ^2 (4) = 5.75, p = .219.

Table 5.18 Hierarchical Multiple Regression Analysis Explaining WFC, Job satisfaction and Work Engagement from Control over Daily Hours

	WFC		Job satisfaction		Work engagement	
Predictor	Δ R^2	β	Δ R^2	β	Δ R^2	β
Step 1	.103***		.028		.028	
Control variables[a]						
Step 2	.128***		.107***		.058***	
MCD vs. LCD		-.32***		.34***		.24**
HCD vs. LCD		-.42***		.33***		.24***
Step 3	.057**		.017		.003	
MCD × G		-.01		.10		.10
HCD × G		-.36***		.21*		.01
MCD × D		-.03		-.04		.02
HCD × D		-.13		.04		.01
Total R^2	.288***		.152***		.090*	

Note. CI = confidence interval. HCD = high control over daily hours. MCD = moderate control over daily hours. LCD = low control over daily hours. G = gender. D = dependents status.

[a] Control variables included gender, age, marital status, dependents status, education level and income.

*p < .05. ** p < .01. *** p < .001.

5.3.2.3 Interaction Effect of ERI and WTC on Health Problems, WFC and Job-related Outcomes

In this section, multiple hierarchical regression analyses were conducted to investigate the combination effect of ERI (adequate reward and inadequate reward) and WTC (low, moderate and high) on dependent variables (Hypothesis 4). In addition, it also investigated whether the interaction effect between ERI and WTC significantly added to the explanation of dependent variables. Personal information was entered in step 1 as control variables. ERI and WTC were entered in step 2; for ERI, effort more than reward was the reference group and for WTC, low WTC was the reference group. The interactions between ERI and WTC were entered in step 3.

In general, this study found ERI and WTC significantly added to the explanation of all dependent variables in this research, including depression,

anxiety, stress, overall mental health problems, chronic fatigue, acute fatigue, intershift recovery, WFC, job satisfaction, turnover intention and work engagement.

Furthermore, the Hypothesis 4 was partially supported: the interaction effect of ERI and WTC was significant in anxiety, overall mental health and job satisfaction. The difference of anxiety, overall mental health and job satisfaction between effort more than reward and effort less than or equal to reward is significantly bigger in employees within low WTC than employees within moderate or high WTC, which may suggest that adequate reward may be more important for employees within low WTC. The following section reports these results in detail.

Table 5.19 indicated that after controlling potential influential personal characteristics, ERI and WTC statistically added to the explanation of depression, R^2 = .125, Δ R^2 = .064, F(3, 254) = 6.15, p < .001, 95% CI [8.71, 16.31]. The interaction effect of ERI and WTC did not significantly add to this explanation, R^2 = .143, Δ R^2 = .018, F(2, 252) = 2.70, p = .069, 95% CI [9.12, 16.75]. However, the difference of depression between effort more than reward and effort less than or equal to reward for low WTC group is significantly bigger than the difference for moderate WTC group, t(252) = 2.26, p = .025.

Table 5.19 Hierarchical Multiple Regression Analysis Explaining Mental Health Variables from ERI and WTC

	Depression		Anxiety		Stress		Overall mental health	
Predictor	Δ R^2	β	Δ R^2	β	Δ R^2	β	Δ R^2	β
Step 1	.061*		.075**		.087**		.079**	
Control variables[a]								
Step 2	.064**		.050**		.088**	-.22***	.074***	
ERI		-.19**		-.16**		-.20**		-.21**
M vs. L		-.19**		-.17*		-.18**		-.20**
H vs. L		-.08		-.12				-.14
Step 3	.018		.037**		.012	.22	.023*	
ERI × M		.26*		.37**		.17		.30**
ERI × H		.11		.30**				.20
Total R^2	.143**		.163**		.188**		.176***	

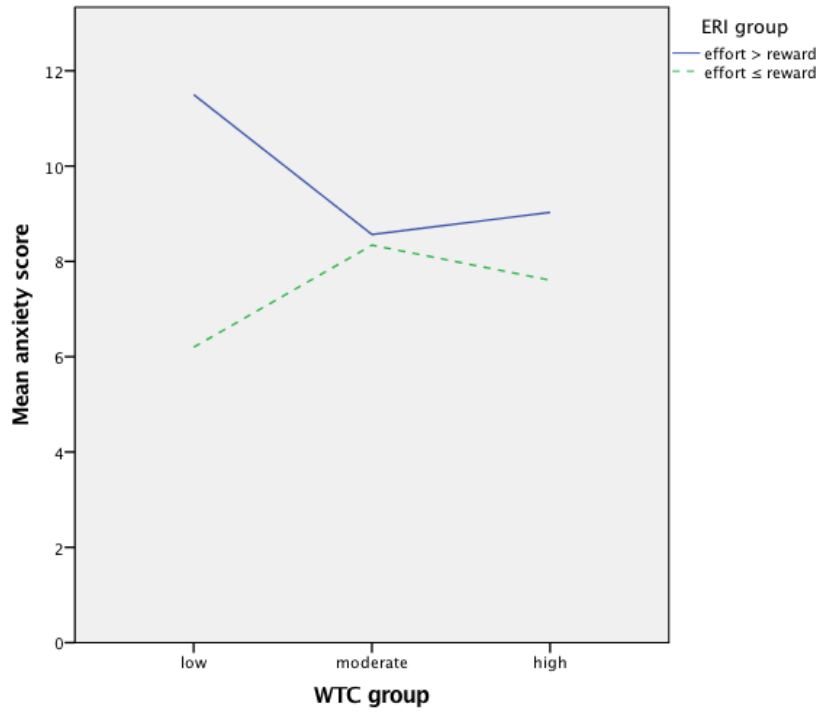
Note. CI = confidence interval. H = high WTC. M = moderate WTC. L = low WTC.

[a] Control variables included gender, age, marital status, dependents status, education level and income.

*p < .05. ** p < .01. *** p < .001.

After controlling potential influential personal characteristics, ERI and WTC statistically added to the explanation of anxiety, R^2 = .126, Δ R^2 = .050, F(3, 254) = 4.89, p = .003, 95% CI [11.38, 18.55]. The interaction effect of ERI and WTC significantly added to this explanation, R^2 = .163, Δ R^2 = .037, F(2, 252) = 5.53, p = .004, 95% CI [12.22, 19.33]. Figure 5.1 shows that the difference of anxiety between effort more than reward and effort less than or equal to reward is significantly bigger than the difference for moderate WTC group, t(252) = 3.20, p = .002 and the difference for high WTC group, t(252) = 2.65 p = .009.

Figure 5.1 Interaction Graph Showing the Effect of WTC on Anxiety at Two Groups of Reward



After controlling potential influential personal characteristics, ERI and WTC statistically added to the explanation of stress, R^2 = .175, Δ R^2 = .088, F(3, 254) = 9.08, p < .001, 95% CI [11.35, 17.98]. The interaction effect of ERI and WTC did not significantly add to this explanation, R^2 = .188, Δ R^2 = .012, F(2, 252) = 1.91, p = .150, 95% CI [11.77, 18.44].

After controlling potential influential personal characteristics, ERI and WTC statistically added to the explanation of overall mental health, R^2 = .153, Δ R^2 = .074, F(3, 254) = 7.38, p < .001, 95% CI [32.20, 52.08]. The interaction effect of ERI and WTC significantly added to this explanation, R^2 = .176, Δ R^2 = .023, F(2, 252) = 3.55, p = .030, 95% CI [33.87, 53.75]. Figure 5.2 shows that the difference of mental health between effort more than reward and effort less than or equal to reward for low WTC group is significantly bigger than the difference for moderate WTC group, t(252) = 2.65, p = .009.

Figure 5.2 Interaction Graph Showing the Effect of WTC on Overall Mental Health at Two Groups of Reward

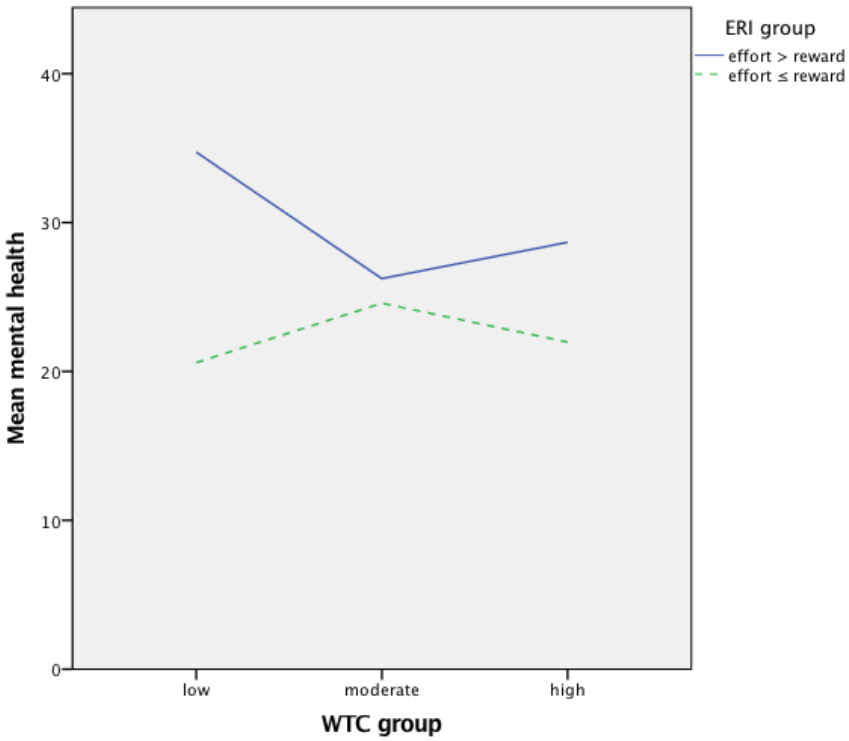


Table 5.20 indicated that after controlling potential influential personal characteristics, ERI and WTC statistically added to the explanation of chronic fatigue, R^2 = .183, Δ R^2 = .151, F(3, 254) = 15.60, p < .001, 95% CI [52.30, 86.81]. The interaction effect of ERI and WTC did not significantly add to this explanation, R^2 = .192, Δ R^2 = .010, F(2, 252) = 1.48, p = .229, 95% CI [51.75, 86.55].

After controlling potential influential personal characteristics, ERI and WTC statistically added to the explanation of acute fatigue, R^2 = .275, Δ R^2 = .223, F(3, 254) = 26.04, p < .001, 95% CI [62.94, 90.76]. The interaction effect of ERI and WTC did not significantly add to this explanation, R^2 = .285, Δ R^2 = .010, F(2, 252) = 1.78, p = .170, 95% CI [62.99, 91.01].

After controlling potential influential personal characteristics, ERI and WTC statistically added to the explanation of intershifit recovery, R^2 = .105, Δ R^2 = .078, F(3, 254) = 7.41, p < .001, 95% CI [21.33, 50.23]. The interaction effect of ERI and WTC did not significantly add to this explanation, R^2 = .107, Δ R^2 = .001, F(2, 252) = 0.18, p = .833, 95% CI [21.76, 51.05].

Table 5.20 Hierarchical Multiple Regression Analysis Explaining Chronic Fatigue, Acute Fatigue and Recovery from ERI and WTC

	Chronic Fatigue		Acute Fatigue		Recovery	
Predictor	Δ R^2	β	Δ R^2	β	Δ R^2	β
Step 1	.032		.052		.027	
Control variables[a]						
Step 2	.151***		.223***		.078***	
ERI		-.22***		-.21***		.08
M vs. L		-.34***		-.38***		.28***
H vs. L		-.30***		-.46		.28***
Step 3	.010		.010		.001	
ERI × M		.08		.13		.07
ERI × H		-.09		-.05		
Total R^2	.192***		.285***		.107**	.06

Note. CI = confidence interval. H = high WTC. M = moderate WTC. L = low WTC.

[a] Control variables included gender, age, marital status, dependents status, education level and income.

*p < .05. ** p < .01. *** p < .001.

Table 5.21 indicated that after controlling potential influential personal characteristics, ERI and WTC statistically added to the explanation of WFC, R^2 = .270, Δ R^2 = .168, F(3, 254) = 19.44, p < .001, 95% CI [32.09, 44.37]. The

interaction effect of ERI and WTC did not significantly add to this explanation, R^2 = .272, Δ R^2 = .002, F(2, 252) = 0.26, p = .769, 95% CI [32.25, 44.69].

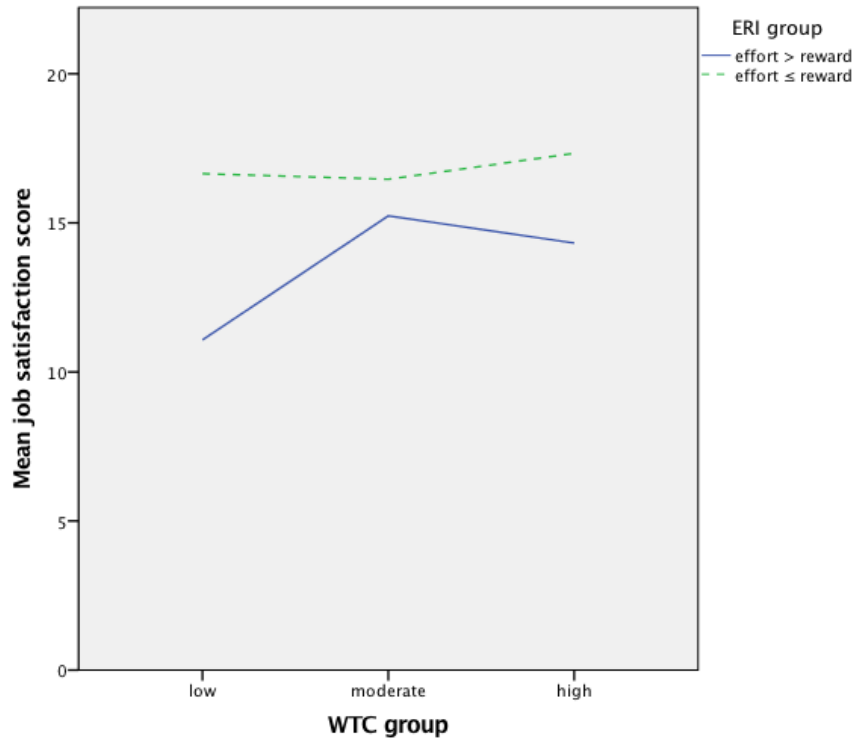
Table 5.21 Hierarchical Multiple Regression Analysis Explaining WFC, Job satisfaction and Work Engagement from ERI and WTC

	WFC		Job satisfaction		Work engagement	
Predictor	Δ R^2	β	Δ R^2	β	Δ R^2	β
Step 1	.103***		.028		.028	
Control variables[a]						
Step 2	.168***		.256***		.107***	
ERI		-.17**		.36***		.20**
M vs. L		-.34***		.39***		.25**
H vs. L		-.40***		.30***		.26**
Step 3	.002		.042**		.011	
ERI × M		.08		-.41***		-.17
ERI × H		.04		-.23*		-.20
Total R^2	.272***		.326***		.146***	

Note. CI = confidence interval. H = high WTC. M = moderate WTC. L = low WTC.
[a] Control variables included gender, age, marital status, dependents status, education level and income.
*p < .05. ** p < .01. *** p < .001.

After controlling potential influential personal characteristics, ERI and WTC statistically added to the explanation of job satisfaction, R^2 = .284, Δ R^2 = .256, F(3, 254) = 30.31, p < .001, 95% CI [9.02, 14.37]. The interaction effect of ERI and WTC significantly added to this explanation, R^2 = .326, Δ R^2 = .042, F(2, 252) = 7.83, p = .001, 95% CI [8.47, 13.72]. Figure 5.3 shows that the difference of job satisfaction between effort more than reward and effort less than or equal to reward for low WTC group is significantly bigger than the difference for moderate WTC group, t(252) = -3.96, p < .001 and the difference for high WTC group, t(252) = -2.26 p = .025.

Figure 5.3 Interaction Graph Showing the Effect of WTC on Job Satisfaction at Two Groups of Reward



After controlling potential influential personal characteristics, ERI and WTC statistically added to the explanation of work engagement, R^2 = .136, Δ R^2 = .107, $F(3, 254) = 10.49$, $p < .001$, 95% CI [14.64, 33.28]. The interaction effect of ERI and WTC did not significantly add to this explanation, R^2 = .146, Δ R^2 = .011, $F(2, 252) = 1.60$, $p = .203$, 95% CI [13.35, 32.14].

The binary logistic regression analysis was conducted to investigate the combing effect of ERI and WTC on turnover intention. The results showed that after controlling potential personal characteristics, ERI and WTC statistically significantly added to the explanation of turnover intention, R^2 = .167, Δ R^2 = .078, $\chi^2(3) = 16.48$, $p = .001$. The interaction effect of ERI and WTC did not significantly add to this explanation, R^2 = .180, Δ R^2 = .013, $\chi^2(2) = 3.05$, $p = .219$.

5.3.2.4 Involuntary & Voluntary Overtime

In this section, on the one hand, it explored the explanatory effect of involuntary overtime (workload and conformity) and voluntary overtime (extrinsic motivation and intrinsic motivation) on dependent variables (Hypothesis 5); on the other hand, it showed the relationships between involuntary & voluntary with ERI and WTC (Hypothesis 6).

a. Involuntary & Voluntary Overtime in relation to Health Problems, WFC and Job-related Outcomes

Table 5.22 showed that involuntary overtime was significantly correlated with higher depression, anxiety, stress, mental health problems, chronic fatigue, acute fatigue, WFC, turnover intention and lower recovery, job satisfaction and work engagement. However, voluntary overtime was significantly correlated with lower depression, anxiety, stress, mental health problems, chronic fatigue, acute fatigue, WFC, turnover intention and higher job satisfaction and work engagement.

Table 5.22 Involuntary & Voluntary Overtime and Outcome Variables Correlations

	Involuntary overtime	Voluntary overtime
Depression	.51***	-.29***
Anxiety	.52***	-.21***
Stress	.57***	-.24***
Mental health	.57***	-.26***
Chronic fatigue	.48***	-.25***
Acute fatigue	.47***	-.43**
Intershift recovery	-.16**	.10
WFC	.51***	-.25***
Job satisfaction	-.54***	.62***
Turnover intention	.32***	-.18**
Work engagement	-.24***	.64**

* $p < .05$. ** $p < .01$. *** $p < .001$.

Furthermore, the hierarchical regression analyses were conducted to investigate the effect of involuntary overtime (including workload and

conformity) and voluntary overtime (including extrinsic motivation and intrinsic motivation) on dependent variables after controlling potential personal characteristics. Personal information was entered in step 1 and four dimensions were entered in step 2.

In general, hypothesis 5 was supported. Four dimensions appear to make different contributions to the explanation of dependent variables. Conformity and intrinsic motivation make significant explanations in depression, anxiety and overall mental health; workload, conformity and intrinsic motivation make significant explanations in stress, chronic fatigue and acute fatigue; intrinsic motivation has a significant effect on intershift recovery; workload and conformity have significant effects on WFC; workload, conformity, extrinsic motivation and intrinsic motivation make significant explanations in job satisfaction; workload, extrinsic motivation and intrinsic motivation has significant influences on work engagement; workload and intrinsic motivation make significant explanations in turnover intention. Moreover, involuntary overtime and voluntary overtime exert opposite influences on dependent variables. The following section presents the results in detail.

Table 5.23 showed that after controlling potential influential personal characteristics, involuntary and voluntary significantly added to the explanation of depression, R^2 = .396, Δ R^2 = .335, F(4, 253) = 35.03, p < .001, 95% CI [-0.27, 9.35]. The explanation was mainly contributed by conformity, β = .50, p < .001, and intrinsic motivation, β = -.22, p = .002; anxiety, R^2 = .413, Δ R^2 = .321, F(4, 253) = 34.35, p < .001, 95% CI [-0.27, 9.35]. The explanation was mainly contributed by conformity, β = .50, p < .001, and intrinsic motivation, β = -.19, p = .006; stress, R^2 = .383, Δ R^2 = .296, F(4, 253) = 33.38, p < .001, 95% CI [0.39, 9.12]. The explanation was mainly contributed by workload, β = .18, p = .003, conformity, β = .41, p < .001, and intrinsic motivation, β = -.17, p = .016; overall mental health, R^2 = .429, Δ R^2 = .349, F(4, 253) = 38.67, p < .001, 95% CI [2.98, 27.85]. The explanation was mainly contributed by conformity, β = .50, p < .001, and intrinsic motivation, β = -.20, p = .004.

Table 5.23 Hierarchical Multiple Regression Analysis Explaining Mental Health Variables from Involuntary and Voluntary Overtime

	Depression		Anxiety		Stress		Overall mental health	
Predictor	Δ R^2	β	Δ R^2	β	Δ R^2	β	Δ R^2	β
Step 1	.061*		.091**		.087**		.079**	
Control variables[a]								
Step 2	.335***		.321***		.296***		.349***	
Workload		.03		.06		.18**		.09
Conformity		.50***		.50***		.41***		.50***
Extrinsic motivation		.03		.05		.05		.05
Intrinsic motivation		-.22**		-.19**		-.17*		-.20**
Total R^2	.335***		.413***		.383***		.429***	

Note. CI = confidence interval.

[a] Control variables included gender, age, marital status, dependents status, education level and income.

*p < .05. ** p < .01. *** p < .001.

Table 5.24 showed that after controlling potential influential personal characteristics, involuntary and voluntary significantly added to the explanation of chronic fatigue, R^2 = .276, Δ R^2 = .244, F(4, 253) = 21.31, p < .001, 95% CI [-4.87, 44.58]. The explanation was mainly contributed by workload, β = .21, p = .002, conformity, β = .32, p < .001, and intrinsic motivation, β = -.18, p = .019; acute fatigue, R^2 = .329, Δ R^2 = .277, F(4, 253) = 26.07, p < .001, 95% CI [35.37, 76.13]. The explanation was mainly contributed by workload, β = .22, p = .001, conformity, β = .17, p = .010, and intrinsic motivation, β = -.28, p < .001; recovery, R^2 = .077, Δ R^2 = .050, F(4, 253) = 3.39, p = .010, 95% CI [23.28, 67.98]. The explanation was mainly contributed by intrinsic motivation, β = .23, p = .008.

Table 5.24 Hierarchical Multiple Regression Analysis Explaining Chronic Fatigue, Acute Fatigue and Recovery from Involuntary and Voluntary Overtime

	Chronic Fatigue		Acute Fatigue		Recovery	
Predictor	Δ R^2	β	Δ R^2	β	Δ R^2	β
Step 1	.032		.052		.027	
Control variables[a]						
Step 2	.244***		.277***		.050*	
Workload		.21**		.22**		-.04
Conformity		.32***		.17*		-.08
Extrinsic motivation		.03		-.09		-.15
Intrinsic motivation		-.18*		-.28***		.23**
Total R^2	.276***		.329***		.077*	

Note. CI = confidence interval.

[a] Control variables included gender, age, marital status, dependents status, education level and income.

*p < .05. ** p < .01. *** p < .001.

Table 5.25 showed that after controlling potential influential personal characteristics, involuntary and voluntary significantly added to the explanation of WFC, R^2 = .304, Δ R^2 = .201, F(4, 253) = 18.31, p < .001, 95% CI [10.44, 28.70]. The explanation was mainly contributed by workload, β = .27, p < .001, and conformity, β = .21, p = .001; job satisfaction, R^2 = .554, Δ R^2

= .526, $F(4, 253) = 74.61$, $p < .001$, 95% CI [11.49, 17.91]. The explanation was contributed by workload, β = -.32, $p < .001$, conformity, β = -.13, $p = .014$, extrinsic motivation, β = .12, $p = .038$, and intrinsic motivation, β = .45, $p < .001$; work engagement, $R^2 = .455$, $\Delta R^2 = .426$, $F(4, 253) = 49.44$, $p < .001$, 95% CI [-4.77, 17.77]. The explanation was mainly contributed by workload, β = -.12, $p = .041$, extrinsic motivation, β = .16, $p = .016$, and intrinsic motivation, β = .53, $p < .001$.

The binary logistic regression analysis was conducted to investigate the effect of involuntary and voluntary overtime on turnover intention. After controlling potential personal characteristics, involuntary and voluntary overtime statistically significantly added to the explanation of turnover intention, $R^2 = .229$, $\Delta R^2 = .140$, $\chi^2 (4) = 30.67$, $p < .001$. The explanation was mainly contributed by workload, $B = 0.11$, $p = .002$, and intrinsic motivation, $B = -0.18$, $p = .002$.

Table 5.25 Hierarchical Multiple Regression Analysis Explaining WFC, Job satisfaction and Work Engagement from Involuntary and Voluntary Overtime

	WFC		Job satisfaction		Work engagement	
Predictor	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	.103***		.028		.028	
Control variables[a]						
Step 2	.201***		.526***		.426***	
Workload		.27***		-.32***		-.12*
Conformity		.21**		-.13*		.05
Extrinsic motivation		-.06		.12*		.16*
Intrinsic motivation		-.10		.45***		.53***
Total R^2	.304***		.554***		.455***	

Note. CI = confidence interval.

[a] Control variables included gender, age, marital status, dependents status, education level and income.

*$p < .05$. ** $p < .01$. *** $p < .001$.

b. Involuntary & Voluntary Overtime in relation to ERI and WTC

Pearson correlation analyses were conducted to test Hypothesis 6 that was supported. The results indicated that involuntary overtime work (workload and conformity) was significantly positively correlated with ERI ratio (r = .55, p < .001 and r = .42, p < .001 respectively) and voluntary overtime work (extrinsic motivation and intrinsic motivation) was significantly negatively correlated with ERI (r = -.38, p < .001 and r = -.43, p < .001 respectively). In addition, Involuntary overtime work (workload and conformity) was significantly negatively related to WTC (r = -.24, p < .001 and r = -.15, p = .016) and voluntary overtime work (extrinsic motivation and intrinsic motivation) was significantly positively related to WTC (r = .34, p < .001 and r = .42, p < .001). These suggest that the higher the effort-reward imbalance and the lower the WTC are, the higher involuntary overtime is and the lower the effort-reward imbalance and the higher the WTC are, the higher voluntary overtime is.

Furthermore, linear regression analysis was conducted to investigate the effects of extrinsic motivation and intrinsic motivation on ERI ratio. The regression results revealed that extrinsic motivation and intrinsic motivation significantly added to the explanation of ERI ratio, R^2 = .267, F(2, 262) = 47.08, p < .001, 95% CI [1.50, 1.71]. Extrinsic motivation (β = -.19, p = .006) and intrinsic motivation (β = -.38, p < .001) respectively affected ERI ratio. These results suggest the relationships between ERI and voluntary overtime. The same analysis was conducted to investigate the influence of ERI and WTC on voluntary overtime and involuntary overtime. ERI (β = -.38, p < .001) and WTC (β = .30, p < .001) significantly added to the explanation of voluntary overtime, R^2 = .304, F(2, 262) = 57.22, p < .001, 95% CI [23.15, 31.68]; the explanatory effect of ERI and WTC on involuntary overtime is mainly contributed by ERI (β = .56 p < .001) not WTC (β = -.04, p = .445), R^2 = .33, F(2, 262) = 64.63, p < .001, 95% CI [11.60, 23.08].

Table 5.26 Involuntary & Voluntary Overtime – ERI ratio and WTC Correlations

Involuntary & voluntary overtime	ERI ratio	WTC
Workload	.55***	-.24***
Conformity	.42***	-.15*
Extrinsic motivation	-.38***	.34***
Intrinsic motivation	-.43***	.42***

*p < .05. ** p < .01. *** p < .001.

5.3.3 Mediation Effect of Involuntary and Voluntary Overtime

This section reports the results of the bootstrapping mediation analyses through conducting SPSS PROCESS to test the indirect effect of ERI ratio on dependent variables through involuntary overtime and the indirect effect of WTC on dependent variables through voluntary overtime (Hypothesis 7 and 7a).

5.3.3.1 Mediation Effect of Involuntary Overtime

Figure 5.4 – 5.13 displayed that the mediation effect of involuntary overtime on the relationships between ERI ratio and Dependent variables. The results showed ERI ratio significantly influenced involuntary overtime, β = 18.16, p < .001. Involuntary overtime significantly influenced depression, anxiety, stress, overall mental health, chronic fatigue, acute fatigue, WFC and job satisfaction, β = 0.22, p < .001; β = 0.20, p < .001; β = 0.22, p < .001; β = 0.64, p < .001; β = 0.96, p < .001; β = 0.48, p < .001; β = 0.37, p < .001; and β = -0.10, p < .001 respectively.

Additionally, except recovery and work engagement, there was a significant indirect effect of ERI ratio on depression through involuntary overtime, β = 3.97, 95% CI [2.46, 5.61], P_M = .61; on anxiety, β = 3.72, 95% CI [2.37, 5.17], P_M = 0.64; on stress, β = 4.00, 95% CI [2.65, 5.48], P_M = .68; on mental health, β = 11.68, 95% CI [7.72, 16.12], P_M = .64; on chronic fatigue, β = 17.50, 95% CI [10.72, 24.68], P_M = .56; on acute fatigue, β = 8.75, 95% CI [3.71, 14.15], P_M

= .26; on WFC, β = 6.72, 95% CI [4.16, 9.32], P_M = .67; on job satisfaction, β = -1.84, 95% CI [-2.91, -0.84], P_M = .21. However, this study did not find the significant indirect effect of ERI ratio on recovery, β = -2.04, 95% CI [-7.64, 3.63], P_M = .18 and work engagement, β = -0.37, 95% CI [-4.16, 3.4], P_M = .02.

Furthermore, the results demonstrate Hypothesis 7 is partially supported: involuntary overtime is a partial mediator of the relationships between ERI ratio and depression, overall mental health, chronic fatigue, acute fatigue and job satisfaction, as well as a complete mediator of the relationships between ERI ratio and anxiety, stress and WFC.

Figure 5.4 Observed Relationships between ERI, Involuntary Overtime and Depression

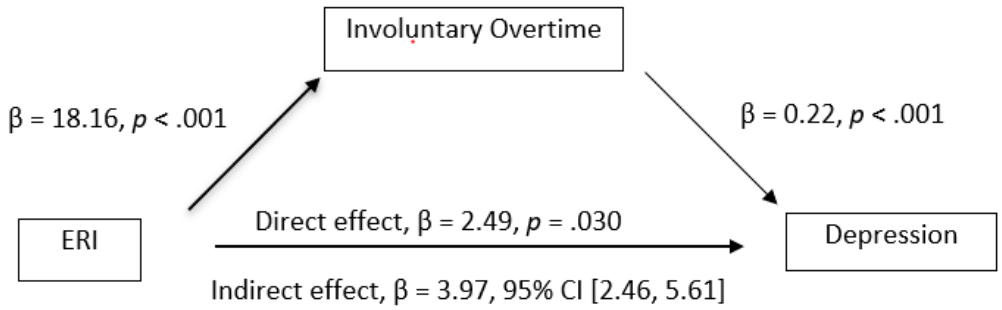


Figure 5.5 Observed Relationships between ERI, Involuntary Overtime and Anxiety

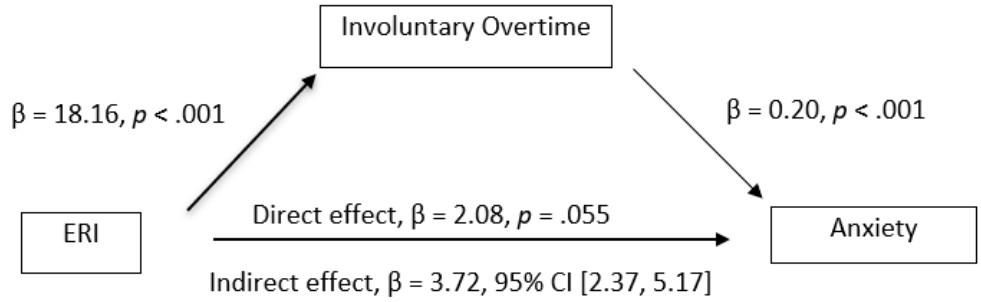


Figure 5.6 Observed Relationships between ERI, Involuntary Overtime and Stress

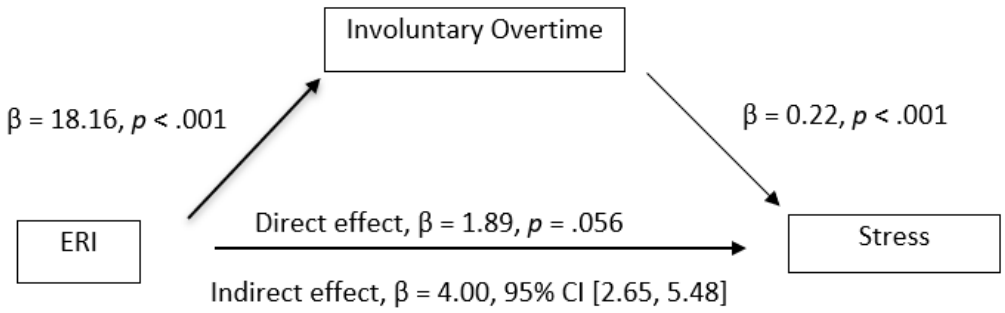


Figure 5.7 Observed Relationships between ERI, Involuntary Overtime and Mental Health

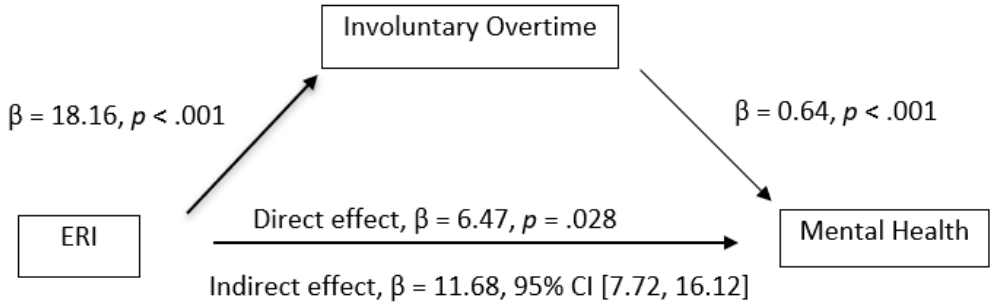


Figure 5.8 Observed Relationships between ERI, Involuntary Overtime and Chronic Fatigue

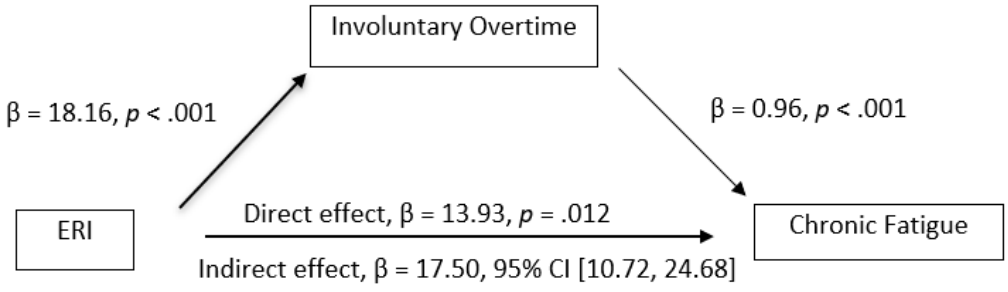


Figure 5.9 Observed Relationships between ERI, Involuntary Overtime and Acute Fatigue

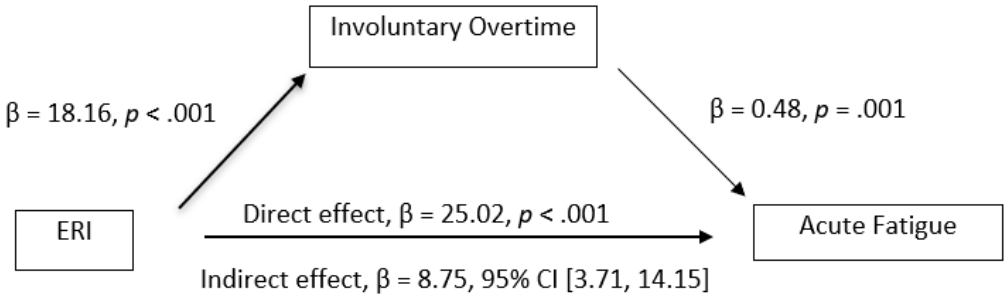


Figure 5.10 Observed Relationships between ERI, Involuntary Overtime and Intershift Recovery

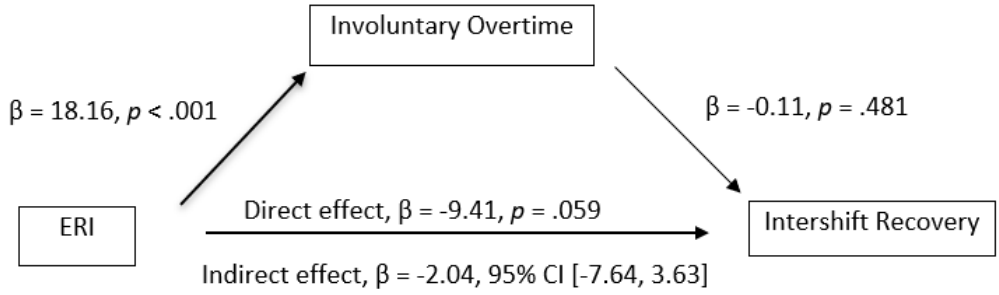


Figure 5.11 Observed Relationships between ERI, Involuntary Overtime and WFC

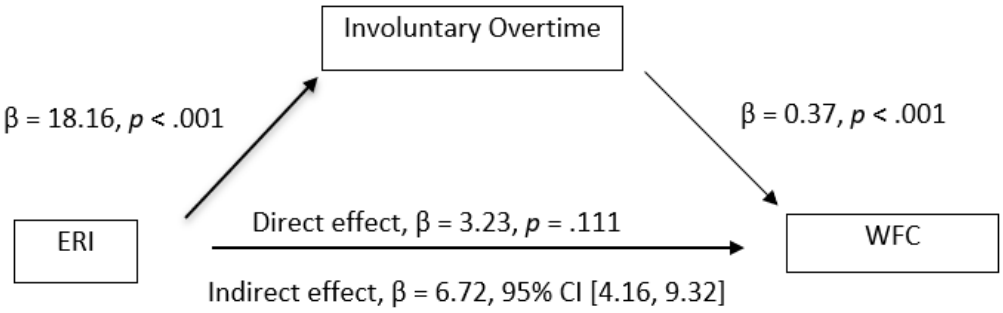


Figure 5.12 Observed Relationships between ERI, Involuntary Overtime and Job Satisfaction

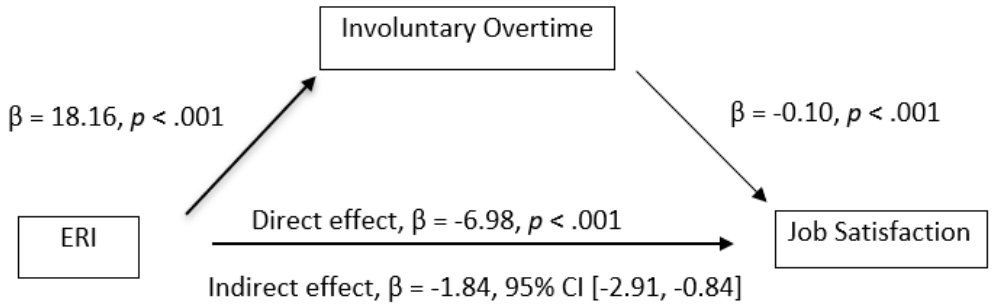
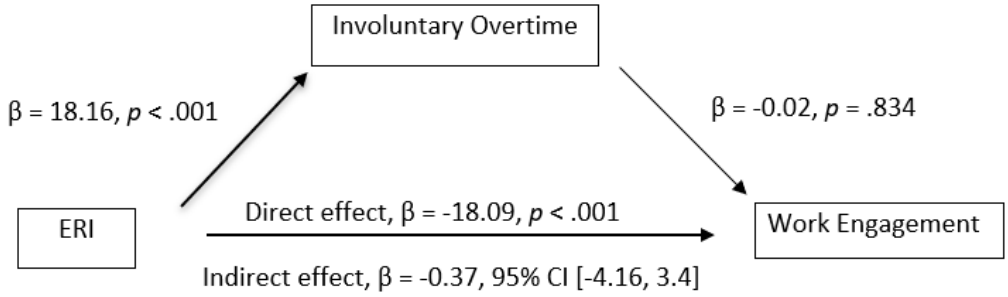


Figure 5.13 Observed Relationships between ERI, Involuntary Overtime and Work Engagement



5.3.3.2 Mediation Effect of Voluntary Overtime

Figure 5.14 – 5.23 displayed that the mediation effect of voluntary overtime on the relationships between WTC and Dependent variables (here, WTC is a continuous variable). The results showed WTC significantly influenced voluntary overtime, β = 0.43, p < .001. Voluntary overtime significantly influenced depression, anxiety, stress, overall mental health, chronic fatigue, acute fatigue, WFC and job satisfaction, β = -0.20, p < .001; β = -0.12, p = .007; β = -0.11, p = .006; β = -0.43, p < .001; β = -0.56, p = .011; β = -0.87, p < .001; β = -0.15, p = .047; β = 0.33, p < .001 and β = 1.14, p < .001 respectively.

Additionally, except recovery, there was a significant indirect effect of WTC on depression through voluntary overtime, β = -0.09, 95% CI [-0.15, -0.03], P_M

= .92; on anxiety, β = -0.05, 95% CI [-0.11, -0.004], P_M = .49; on stress, β = -0.05, 95% CI [-0.11, -0.005], P_M = .34; on mental health, β = -0.19, 95% CI [-0.36, -0.05], P_M = .54; on chronic fatigue, β = -0.24, 95% CI [-0.51, -0.03], P_M = .25; on acute fatigue, β = -0.38, 95% CI [-0.61, -0.20], P_M = .29; on job satisfaction, β = 0.14, 95% CI [0.09, 0.20], P_M = .71 and work engagement, β = 0.49 95% CI [0.33, 0.68]. For work engagement, the direct effect and indirect effect have opposite signs, which was considered as an inconsistent mediation model, the effect size of this situation is less clear (Wen & Fan, 2015). This study did not find the significant indirect effect of WTC on recovery, β = 0.08, 95% CI [-0.15, 0.25], P_M = .18 and WFC, β = -0.07, 95% CI [-0.17, 0.01], P_M = .14.

Furthermore, the results demonstrate that Hypothesis 7a is partially supported: voluntary overtime is a partial mediator of the relationships between WTC and stress, chronic fatigue, acute fatigue and WFC, as well as a complete mediator of the relationships between WTC and depression, anxiety, overall mental health, job satisfaction and work engagement.

Figure 5.14 Observed Relationships between WTC, Voluntary Overtime and Depression

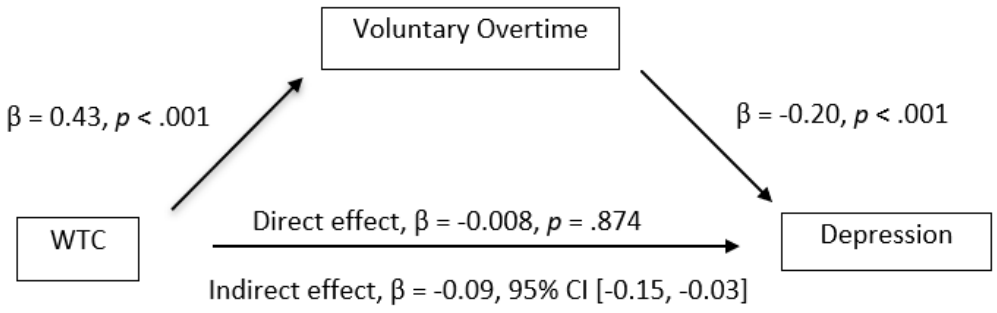


Figure 5.15 Observed Relationships between WTC, Voluntary Overtime and Anxiety

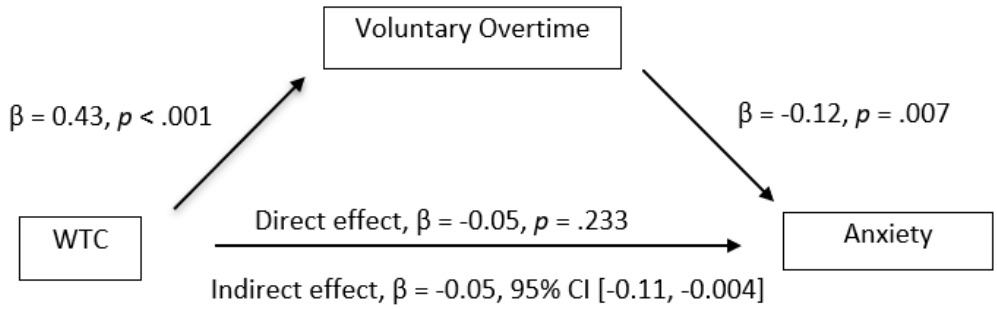


Figure 5.16 Observed Relationships between WTC, Voluntary Overtime and Stress

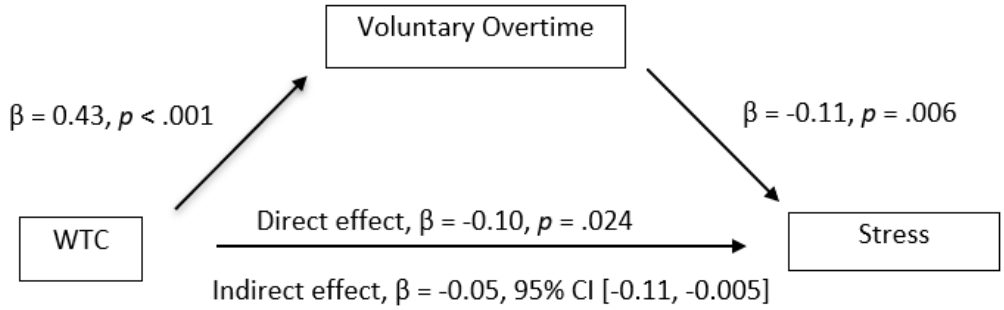


Figure 5.17 Observed Relationships between WTC, Voluntary Overtime and Mental Health

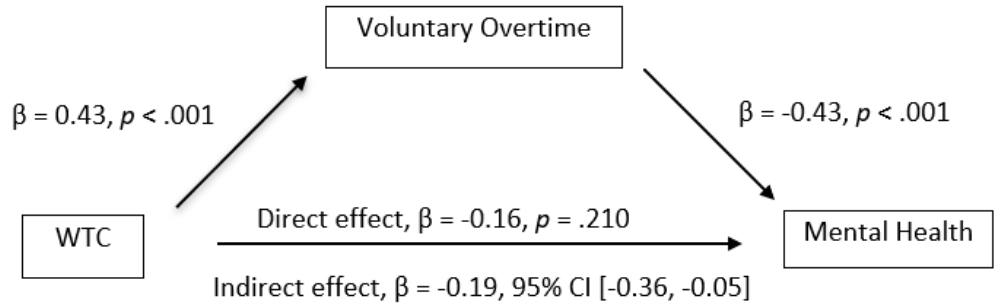


Figure 5.18 Observed Relationships between WTC, Voluntary Overtime and Chronic Fatigue

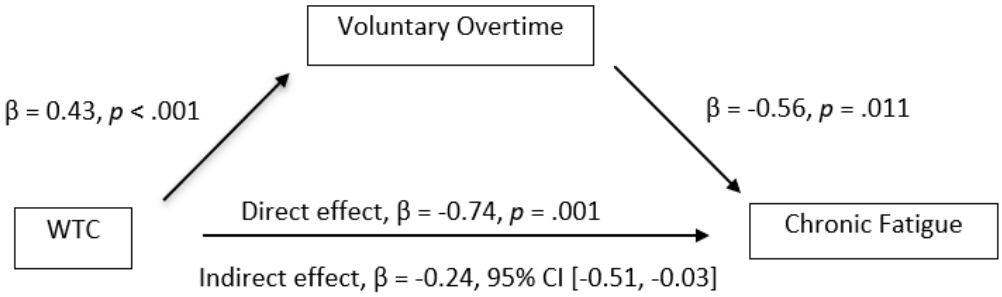


Figure 5.19 Observed Relationships between WTC, Voluntary Overtime and Acute Fatigue

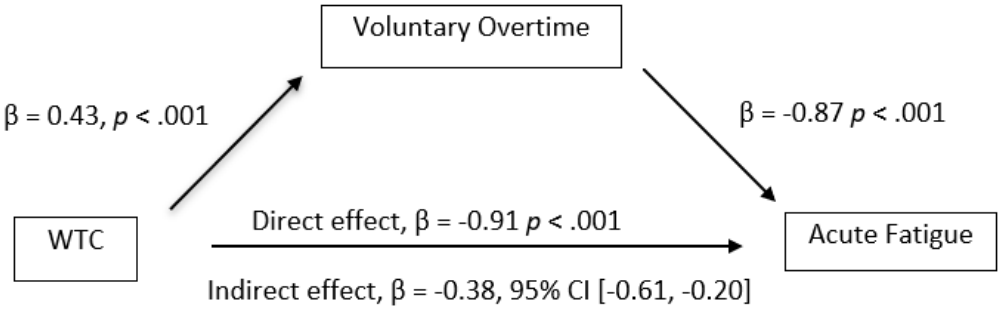


Figure 5.20 Observed Relationships between WTC, Voluntary Overtime and Intershift Recovery

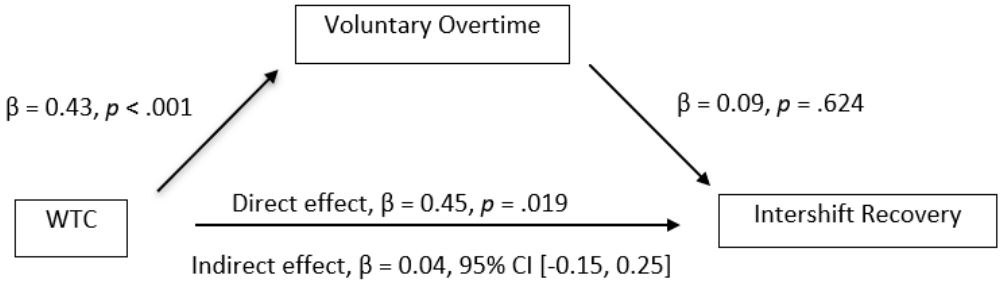


Figure 5.21 Observed Relationships between WTC, Voluntary Overtime and WFC

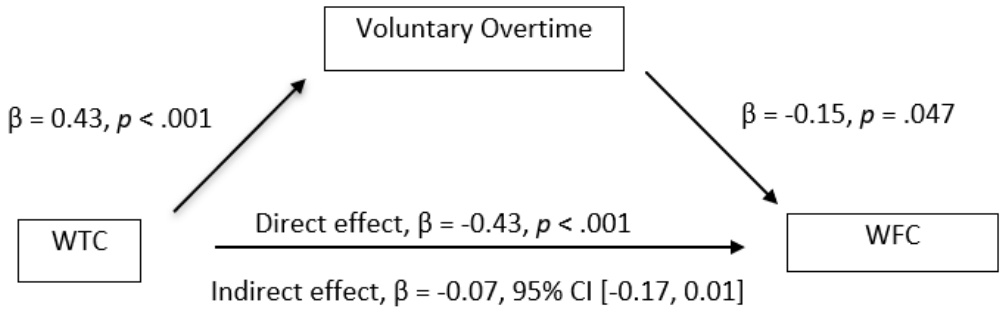


Figure 5.22 Observed Relationships between WTC, Voluntary Overtime and Job Satisfaction

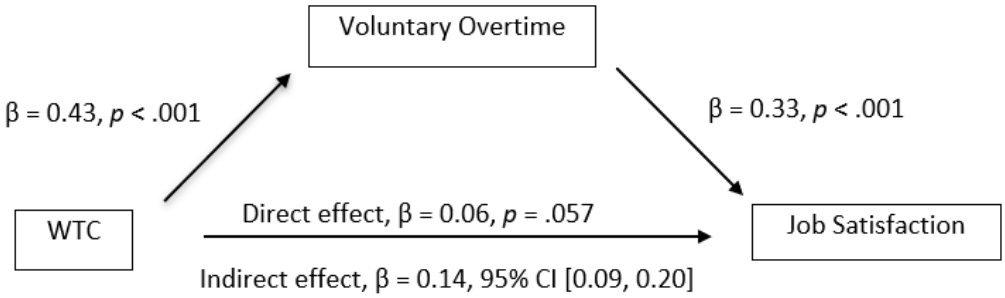
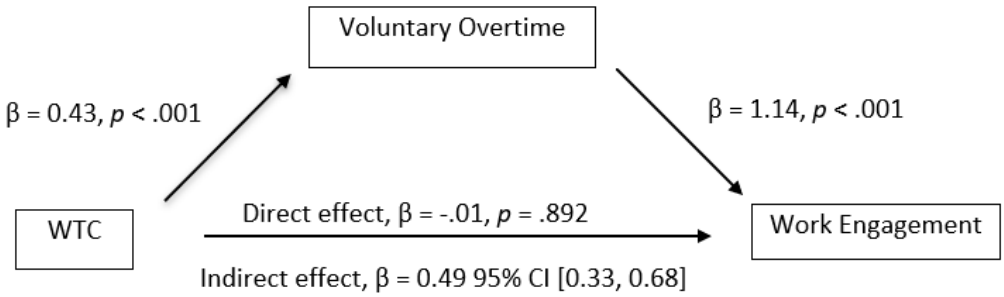


Figure 5.23 Observed Relationships between WTC, Voluntary Overtime and Work Engagement



5.3.4 Moderation Effect of ERI, WTC and Voluntary Overtime

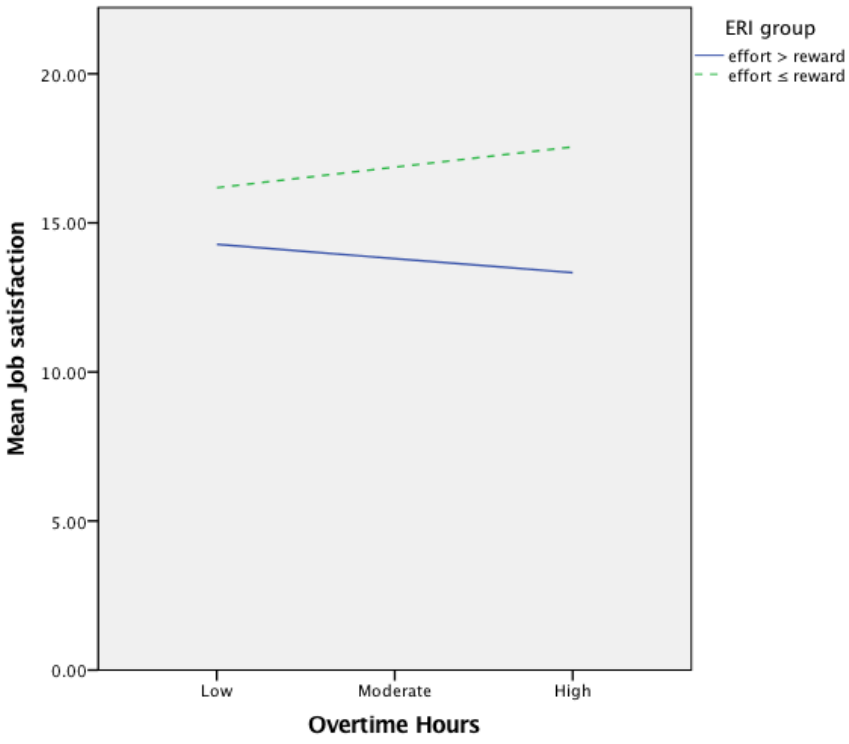
In this section, the moderation regression analyses were conducted to investigate the moderation effect of ERI, WTC (including control over time-off and control over daily hours) and voluntary overtime on the relationships between overtime hours and dependent variables in this study (Hypotheses 8, 8a, 8b and 8c).

In general, this study found the moderation effect of ERI on the relationships between overtime hours and job satisfaction; control over time-off on the relationships between overtime hours and anxiety, stress, overall mental health, acute fatigue, recovery, WFC and job satisfaction; control over daily hours on the relationships between overtime hours and anxiety, stress, WFC and job satisfaction; voluntary overtime on the relationships between overtime hours and all dependent variables except turnover intention.

5.3.4.1 ERI on Relationships between Overtime Hours and Dependent Variables

The results indicated that the interaction effect of ERI group with overtime hours significantly added to the explanation of job satisfaction, R^2 = .196, Δ R^2 = .021, $F(1, 254) = 6.54$, p = .011, 95% CI [0.01, 0.04]. The interaction is illustrated in Figure 5.24. It shows conditional effects of overtime hours on job satisfaction at two levels of reward. The difference in the slopes of overtime hours for two groups of reward was significant, B = .19, p = .011.

Figure 5.24 Impact of ERI on the Overtime Hours – Job Satisfaction Relationship



However, the interaction effect of ERI with overtime hours did not significantly add to the explanation of other dependent variables, including depression, R^2 = .107, Δ R^2 = .002, F(1, 254) = 0.50, p = .478, 95% CI [-0.26, 0.12]; anxiety, R^2 = .118, Δ R^2 = .009, F(1, 254) = 2.52, p = .114, 95% CI [-0.33, 0.04]; stress, R^2 = .152, Δ R^2 = .006, F(1, 254) = 1.70, p = .193, 95% CI [-0.28, 0.06]; overall mental health, R^2 = .136, Δ R^2 = .006, F(1, 254) = 1.63, p = .203, 95% CI [-0.84, 0.18]; chronic fatigue, R^2 = .124, Δ R^2 = .008, F(1, 254) = 2.33, p = .128, 95% CI [-1.60, 0.20]; acute fatigue, R^2 = .156, Δ R^2 = .007, F(1, 254) = 2.04, p = .155, 95% CI [-1.31, 0.21]; recovery, R^2 = .074, Δ R^2 = .007, F(1, 254) = 2.03, p = .156, 95% CI [-0.21, 1.28]; WFC, R^2 = .183, Δ R^2 = .008, F(1, 254) = 2.56, p = .111, 95% CI [-0.59, 0.06]; turnover intention, R^2 = .163, Δ R^2 = .005, χ^2 (1) = 1.12, p = .291, 95% CI [0.87, 1.04]; and work engagement R^2 = .089, Δ R^2 = .007, F(1, 254) = 2.08, p = .151, 95% CI [-0.13, 0.84].

Therefore, the Hypothesis 8 is only partially supported: ERI moderates the relationships between overtime hours and job satisfaction, not in terms of health problems, WFC as well as turnover intention and work engagement.

5.3.4.2 WTC on Relationships between Overtime Hours and Health Problems, WFC and Job-related Outcomes

a. Control over Time-off on Relationships between Overtime Hours and Health Problems, WFC, and Job-related Outcomes

In terms of mental health, Table 5.27 indicated that the interaction effect of overtime hours with control over time-off significantly added to the explanation of anxiety, R^2 = .059, Δ R^2 = .019, F(1, 261) = 5.21, p = .023, 95% CI [-0.18, -0.01]; stress, R^2 = .118, Δ R^2 = .054, F(1, 261) = 16.00, p < .001, 95% CI [-0.23, -0.08] and overall mental health, R^2 = .076, Δ R^2 = .028, F(1, 261) = 7.77, p = .006, 95% CI [-0.56, -0.10].

The interaction was probed by testing the conditional effects of overtime hours at three levels of control over time-off: one standard deviation below the mean, at the mean, and one standard deviation above the mean. As shown in Table 5.27, overtime hours was significantly related to anxiety, stress and overall mental health when control over time-off was one standard deviation below the mean (B = 0.16, p = .010; B = 0.21, p < .001 and B = 0.52, p = .002 respectively), but not when control over time-off was at the mean (B = 0.06, p = .163; B = 0.05 p = .208 and B = 0.19 p = .116 respectively) and one standard deviation above the mean (B = -0.04, p = .554; B = -0.11, p = .060 and B = -0.14, p = .415 respectively).

Furthermore, the Johnson-Neyman significance region showed that the relationships between overtime hours with anxiety and mental health were significant when control over time-off was greater than 0.29 and 0.15 standard deviations respectively below the mean but not significant with

higher values of control over time-off. It was interesting that overtime hours was positively significantly correlated with stress when control over time-off was greater than 0.19 standard deviations below the mean but not significant with higher values of control over time-off; additionally, overtime hours was negatively correlated with stress when control over time-off was greater than 1.05 standard deviations above the mean.

Table 5.27 Coefficients for Control over Time-off as a Moderator of the Overtime Hours – Mental Health Factors Relationships

	Anxiety		Stress		Overall mental health	
Predictor	*B*	95% CI	*B*	95% CI	*B*	95% CI
Constant	8.81***	[8.27, 9.34]	9.21***	[8.72, 9.70]	26.80***	[25.31, 28.29]
OH	0.06	[-0.03, 0.15]	0.05	[-0.03, 0.13]	0.19	[-0.05, 0.43]
CT	-0.69*	[-1.23, -0.15]	-0.86**	[-1.36, -0.36]	-2.11 **	[-3.62, -0.60]
OH × CT	-0.10*	[-0.17, 0.01]	-0.16***	[-0.23, -0.08]	-0.33 **	[-0.56, -0.10]
LCT	0.16*	[0.04, 0.28]	0.21***	[0.10, 0.32]	0.52**	[0.19, 0.85]
MCT	0.06	[-0.03, 0.15]	0.05	[-0.03, 0.13]	0.19	[-0.05, 0.43]
HCT	-0.04	[-0.16, 0.08]	-0.11	[-0.22, 0.01]	-0.14	[-0.47, 0.20]

Note. CI = confidence interval. OH = overtime hours. CT = control over time-off. HCT= high control over time-off. MCT= moderate control over time-off. LCT= low control over time-off.

R^2 = .059, Δ R^2 = .019 for anxiety; R^2 = .118, Δ R^2 = .054 for stress; R^2 = .076, Δ R^2 = .028 for overall mental health.

*p < .05. ** p < .01. *** p < .001.

In terms of fatigue and intershift recovery, Table 5.28 indicated that the interaction effect of overtime hours with control over time-off significantly added to the explanation of acute fatigue, R^2 = .221, Δ R^2 = .013, F(1, 261) = 4.28, p = .040, 95% CI [-0.66, -0.02] and intershift recovery, R^2 = .077, Δ R^2 = .018, F(1, 261) = 5.13, p = .024, 95% CI [0.05, 0.71]. Furthermore, the conditional effects showed that overtime hours was significantly related to

acute fatigue and intershift recovery when control over time-off was one standard deviation below the mean (B = 0.84, p < .001 and B = -0.81, p = .001 respectively) and at the mean (B = 0.50, p = .003 and B = -0.43, p = .012 respectively), but not when control over time-off was one standard deviation above the mean (B = 0.16, p = .496 and B = -0.05, p = .826 respectively). The Johnson-Neyman significance region showed that the relationships between overtime hours with acute fatigue and intershift recovery were significant when control over time-off was greater than 0.42 and 0.23 standard deviations respectively below the mean but not significant with higher values of control over time-off.

In addition, the interaction effect of overtime hours with control over time-off significantly added to the explanation of WFC, R^2 = .196, Δ R^2 = .022, F(1, 261) = 7.28, p = .007, 95% CI [-0.34, -0.05] and job satisfaction, R^2 = .144, Δ R^2 = .025, F(1, 261) = 7.77, p = .006, 95% CI [0.03, 0.16]. Overtime hours was significantly related to WFC when control over time-off was one standard deviation below the mean (B = 0.44, p < .001) and at the mean (B = 0.24, p = .002), but not when control over time-off was one standard deviation above the mean (B = 0.04, p = .692); and job satisfaction when control over time-off was one standard deviation below the mean (B = -0.11, p = .023), but not when control over time-off was at the mean (B = -0.02, p = .634) and one standard deviation above the mean (B = 0.08, p = .110).

The Johnson-Neyman significance region showed that the relationship between overtime hours and WFC was significant when control over time-off was greater than 0.41 standard deviations respectively below the mean but not significant with higher values of control over time-off. Overtime hours was negatively significantly correlated with job satisfaction when control over time-off was greater than 0.70 standard deviations below the mean but not significant with higher values of control over time-off; additionally, overtime hours was positively correlated with job satisfaction when control over time-off was greater than 1.41 standard deviations above the mean.

This study did not show significant explanation of the interaction effect of overtime hours with control over time-off in depression, R^2 = .041, Δ R^2 = .011, F(1, 261) = 2.88, p = .091, 95% CI [-0.17, 0.01]; chronic fatigue, R^2 = .122, Δ R^2 = .007, F(1, 261) = 2.21, p = .138, 95% CI [-0.70, 0.10]; and work engagement, R^2 = .061, Δ R^2 = .009, F(1, 261) = 2.60, p = .108, 95% CI [-0.04, 0.40]. In addition, the binary logistic regression analysis displayed that the interaction effect of overtime hours with control over time-off did not significantly add to the explanation of turnover intention, R^2 = .043, Δ R^2 = .002, χ^2 (1) = 0.32, p = .574.

Therefore, Hypothesis 8a was mainly supported: control over time-off moderates the relationships between overtime hours and anxiety, stress, overall mental health, acute fatigue, intershift recovery, WFC and job satisfaction, not in terms of depression, chronic fatigue, turnover intention and work engagement.

Table 5.28 Coefficients for Control over Time-off as a Moderator of the Overtime Hours – Acute Fatigue, Intershift Recovery, WFC and Job Satisfaction Relationships

	Acute fatigue		Intershift recovery		WFC		Job satisfaction	
Predictor	*B*	95% CI	*B*	95% CI	*B*	95% CI	*B*	95% CI
Constant	53.48***	[51.40, 55.55]	50.39***	[48.27, 52.50]	27.11***	[26.18, 28.04]	14.92***	[14.50, 15.34]
OH	0.50**	[0.17, 0.83]	-0.43*	[-0.77, -0.09]	0.24**	[0.09, 0.39]	-0.02	[-0.08, 0.05]
CT	-7.57***	[-9.67, -5.47]	2.82*	[0.69, 4.96]	-2.86***	[-3.79, -1.92]	1.18***	[0.76, 1.61]
OH × CT	-0.34*	[-0.66, -0.02]	0.38*	[0.05, 0.71]	-0.20**	[-0.34, -0.05]	0.09**	[0.03, 0.16]
LCT	0.84***	[0.38, 1.30]	-0.81**	[-1.28, -0.34]	0.44***	[0.23, 0.65]	-0.11*	[-0.20, -0.02]
MCT	0.50**	[0.17, 0.83]	-0.43*	[-0.77, -0.09]	0.24**	[0.09, 0.39]	-0.02	[-0.08, 0.05]
HCT	0.16	[-0.30, 0.62]	-0.05	[-0.53, 0.42]	0.04	[-0.17, 0.25]	0.08	[-0.02, 0.17]

Note. CI = confidence interval. OH = overtime hours. CT = control over time-off. HCT= high control over time-off. MCT= moderate control over time-off. LCT= low control over time-off.

R^2 = .221, Δ R^2 = .013 for acute fatigue; R^2 = .077, Δ R^2 = .018 for intershift recovery; R^2 = .196, Δ R^2 = .022 for WFC; R^2 = .144, Δ R^2 = .025 for job satisfaction.

*p < .05. ** p < .01. *** p < .001.

b. Control over Daily Hours on Relationships Between Overtime Hours and Health Problems, WFC and Job-related Outcomes

In terms of mental health, Table 5.29 indicated that the interaction effect of overtime hours with control over daily hours significantly added to the explanation of anxiety, R^2 = .032, Δ R^2 = .015, F(1, 261) = 4.00, p = .047, 95% CI [-0.17, -0.001]; stress, R^2 = .054, Δ R^2 = .025, F(1, 261) = 7.02, p = .009, 95% CI [-0.18, -0.03] and overall mental health, R^2 = .044, Δ R^2 = .018, F(1, 261) = 4.98, p = .026, 95% CI [-0.49, -0.03]. The conditional effects showed that overtime hours was significantly related to anxiety, stress and overall mental health when control over daily hours was one standard deviation below the mean (B = 0.14, p = .017; B = 0.14, p = .008 and B = 0.42, p = .009 respectively), but not when control over daily hours was at the mean (B = 0.05, p = .294, B = 0.03, p = .451 and B = 0.14, p = .254 respectively) and above the mean (B = -0.04, p = .560; B = -0.08, p = .234 and B = -0.13, p = .502 respectively). However, the interaction effect of overtime hours with control over daily hours did not significantly add to the explanation of depression, R^2 = .033, Δ R^2 = .010, F(1, 261) = 2.76, p = .098, 95% CI [-0.116, 0.01].

Furthermore, the Johnson-Neyman significance region showed that the relationships between overtime hours with anxiety, stress and overall mental health were significant when control over daily hours was greater than 0.52, 0.51, 0.39 standard deviations respectively below the mean but not significant with higher values of control over daily hours.

Table 5.29 Coefficients for Control Daily Hours as a Moderator of the Overtime Hours – Mental Health Factors Relationships

	Anxiety		Stress		Overall mental health	
Predictor	*B*	95% CI	*B*	95% CI	*B*	95% CI
Constant	8.80***	[8.25, 9.34]	9.22***	[8.70, 9.73]	26.78***	[25.25, 28.31]
OH	0.05	[-0.04, 0.14]	0.03	[-0.05, 0.12]	0.14	[-0.10, 0.39]
CD	-0.40	[-0.92, 0.12]	-0.61*	[-1.10, -0.12]	-1.47*	[-2.94, -0.01]
OH × CD	-0.08*	[-0.17, -0.001]	-0.10**	[-0.18, -0.03]	-0.26*	[-0.49, -0.03]
LCD	0.14*	[0.02, 0.25]	0.14**	[0.04, 0.25]	0.42**	[-.11, 0.73]
MCD	0.05	[-0.04, 0.14]	0.03	[-0.05, 0.12]	0.14	[-0.10, 0.39]
HCD	-0.04	[-0.18, 0.10]	-0.08	[-0.21, 0.05]	-0.13	[-0.51, 0.25]

Note. CI = confidence interval. OH = overtime hours. CD = control over daily hours. HCD= high control over daily hours. MCD= moderate control over daily hours. LCD = low control over daily hours.

R^2 = .032, Δ R^2 = .015 for anxiety; R^2 = .054, Δ R^2 = .025 for stress; R^2 = .044, Δ R^2 = .018 for overall mental health.

*p < .05. ** p < .01. *** p < .001.

In terms of fatigue and intershift recovery, the interaction effect of overtime hours with control over daily hours did not significantly add to the explanation of chronic fatigue, R^2 = .069, Δ R^2 = .003, F(1, 261) = 0.96, p = .328, 95% CI [-0.60, 0.20]; acute fatigue, R^2 = .151, Δ R^2 = .007, F(1, 261) = 2.27, p = .133, 95% CI [-0.58, 0.08] and intershift recovery, R^2 = .041, Δ R^2 = .007, F(1, 261) = 1.92, p = .167, 95% CI [-0.10, 0.56].

Table 5.30 showed that the interaction effect of overtime hours with control over daily hours significantly added to the explanation of WFC, R^2 = .135, Δ R^2 = .025, F(1, 261) = 7.66, p = .006, 95% CI [-0.35, -0.06] and job satisfaction, R^2 = .100, Δ R^2 = .020, F(1, 261) = 5.76, p = .017, 95% CI [0.01, 0.15]. The conditional effects showed that overtime hours was significantly related to WFC when control over daily hours was one standard deviation below the

mean (B = 0.41, p < .001) and at the mean (B = 0.20, p = .013), but not when control over daily hours was one standard deviation above the mean (B = -0.02, p = .899). Overtime hours was not significantly related to job satisfaction when control over daily hours was one standard deviation below the mean (B = -0.08, p = .071), at the mean (B = 0.002 p = .950) and one standard deviation above the mean (B = 0.09, p = .118).

Furthermore, the Johnson-Neyman significance region showed the relationship between overtime hours and WFC was significant when control over daily hours was greater than 0.17 standard deviations below the mean but not significant with higher values of control over daily hours. There was a significant negative relationship between overtime hours and job satisfaction when control over daily hours was less than 1.23 standard deviations below the mean, but a significant positive relationship between overtime hours and job satisfaction when control over daily hours was greater than 1.94 standard deviations above the mean.

This study did not show the interaction effect of overtime hours with control over daily hours significantly added to the explanation of work engagement, R^2 = .089, Δ R^2 = .012, F(1, 261) = 3.35, p = .068, 95% CI [-0.02, 0.40]. In addition, the binary logistic regression analysis displayed that the interaction effect of overtime hours with control daily hours did not significantly add to the explanation of turnover intention, R^2 = .019, Δ R^2 = .000, χ^2 (1) = 0.03, p = .853.

Overall, the Hypothesis 8b was partially supported: control over daily hours moderates the relationships between overtime hours and anxiety, stress, overall mental health, WFC and job satisfaction, not in terms of depression, chronic fatigue, acute fatigue, intershift recovery, turnover intention and work engagement.

Table 5.30 Coefficients for Control Daily Hours as a Moderator of the Overtime Hours – WFC and Job Satisfaction Relationships

	WFC		Job satisfaction	
Predictor	*B*	95% CI	*B*	95% CI
Constant	27.05***	[26.09, 28.02]	14.93***	[14.50, 15.36]
OH	0.20*	[0.04, 0.36]	0.002	[-0.07, 0.07]
CD	-2.14***	[-3.06, -1.21]	1.02***	[0.61, 1.44]
OH × CD	-0.21**	[-0.35, -0.06]	0.08*	[0.01, 0.15]
LCD	0.41***	[0.22, 0.61]	-0.08	[-0.17, 0.01]
MCD	0.20*	[0.04, 0.36]	0.002	[-0.07, .07]
HCD	-0.02	[-0.26, 0.23]	0.09	[-0.02, 0.19]

Note. CI = confidence interval. OH = overtime hours. CD = control over daily hours. HCD= high control over daily hours. MCD= moderate control over daily hours. LCD = low control over daily hours.

R^2 = .135, Δ R^2 = .025 for WFC; R^2 = .100, Δ R^2 = .020 for job satisfaction.

*p < .05. ** p < .01. *** p < .001.

5.3.4.3 Voluntary Overtime on Relationships between Overtime Hours and Health Problems, WFC and Job-related Outcomes

In terms of mental health, Table 5.31 indicated that the interaction effect of overtime hours with voluntary overtime significantly added to the explanation of depression, R^2 = .112, Δ R^2 = .023, F(1, 261) = 6.66, p = .010, 95% CI [-0.03, -0.004]; anxiety, R^2 = .074, Δ R^2 = .021, F(1, 261) = 6.02, p = .015, 95% CI [-0.03, -0.003]; stress, R^2 = .092, Δ R^2 = .031, F(1, 261) = 8.82, p = .003, 95% CI [-0.03, -0.01] and overall mental health, R^2 = .105, Δ R^2 = .028, F(1, 261) = 8.20, p = .026, 95% CI [-0.08, -0.02]. The conditional effects showed that overtime hours was significantly related to depression, anxiety, stress and overall mental health when voluntary overtime was 6.63 standard deviations below the mean (B = 0.17, p = .005; B = 0.15, p = .010; B = 0.15, p = .005 and B = 0.46, p = .003 respectively), but not when voluntary overtime was at the mean (B = 0.05, p = .235; B = 0.04, p = .307; B = 0.04, p = .391 and B = 0.13, p = .269 respectively) and 6.63 standard deviations above the mean (B = -0.06, p = .384; B = -0.06, p = .368; B = -0.08, p = .178 and B = -0.20, p = .267 respectively).

Furthermore, the Johnson-Neyman significance region showed the positive relationships between overtime hours with depression and anxiety were significant when voluntary overtime was greater than 2.13 and 2.84 standard deviations respectively below the mean but not significant with higher values of voluntary overtime. Additionally, the positive relationships between overtime hours with stress and overall mental health were significant when voluntary overtime was greater than 2.70 and 2.12 standard deviations respectively below the mean; the relationships between overtime hours with stress and overall mental health became significantly negative when voluntary overtime was greater than 11.24 and 13.87 standard deviations respectively above the mean.

Table 5.31 Coefficients for Voluntary Overtime as a Moderator of the Overtime Hours – Mental Health Factors Relationships

	Depression		Anxiety		Stress		Overall mental health	
Predictor	*B*	95% CI	*B*	95% CI	*B*	95% CI	*B*	95% CI
Constant	8.76***	[8.21, 9.31]	8.80***	[8.27, 9.22]	9.23***	[8.73, 9.73]	26.79***	[25.32, 28.26]
OH	0.05	[-0.04, 0.14]	0.04	[-0.04, 0.13]	0.04	[-0.05, 0.12]	0.13	[-0.10, 0.37]
VO	-0.19***	[-0.27, -0.11]	-0.13**	[-0.21, -0.05]	-0.14***	[-0.21, -0.06]	-0.46***	[-0.68, -0.23]
OH × VO	-0.02*	[-0.03, -0.004]	-0.02*	[-0.03, -0.003]	-0.02**	[-0.03, -0.01]	-0.05**	[-0.08, -0.02]
LVO	0.17**	[0.05, 0.28]	0.15*	[0.04, 0.26]	0.15**	[0.05, 0.26]	0.46**	[0.16, 0.77]
MVO	0.05	[-0.04, 0.14]	0.04	[-0.04, 0.13]	0.04	[-0.05, 0.12]	0.13	[-0.10, 0.37]
HVO	-0.06	[-0.19, 0.07]	-0.06	[-0.18, 0.07]	-0.08	[-0.20, 0.04]	-0.20	[-0.55, 0.15]

Note. CI = confidence interval. OH = overtime hours. VO = voluntary overtime. HVO = high voluntary overtime. MVO = moderate voluntary overtime. LVO = low voluntary overtime.

R^2 = .112, Δ R^2 = .023 for depression; R^2 = .074, Δ R^2 = .021 for anxiety; R^2 = .092, Δ R^2 = .031 for stress; R^2 = .105, Δ R^2 = .028 for mental health.

*p < .05. ** p < .01. *** p < .001.

In terms of fatigue and intershift recovery, Table 5.32 indicated that the interaction effect of overtime hours with voluntary overtime significantly added to the explanation of chronic fatigue, R^2 = .107, Δ R^2 = .016, F(1, 261) = 4.79, p = .029, 95% CI [-0.13, -0.01]; acute fatigue, R^2 = .225, Δ R^2 = .013, F(1, 261) = 4.54, p = .034, 95% CI [-0.10, -0.004]; and intershift recovery, R^2 = .052, Δ R^2 = .018, F(1, 261) = 4.90, p = .028, 95% CI [0.01, 0.11]. The conditional effects showed that overtime hours was significantly related to chronic fatigue, acute fatigue and intershift recovery when voluntary overtime was 6.63 standard deviations below the mean (B = 0.97, p = .001; B = 0.80, p < .001; and B = -0.78, p = .001 respectively) and at the mean (B = 0.52, p = .015; B = 0.45, p = .008; and B = -0.41, p = .020 respectively), but not when voluntary overtime was 6.63 standard deviations above the mean (B = 0.07, p = .812; B = 0.10, p = .677; and B = -0.04, p = .881 respectively).

Furthermore, the Johnson-Neyman significance region showed the positive relationships between overtime hours with chronic fatigue, acute fatigue and intershift recovery were significant when voluntary overtime was greater than 1.26, 1.80 and 0.98 standard deviations respectively below the mean but not significant with higher values of voluntary overtime.

Table 5.32 Coefficients for Voluntary Overtime as a Moderator of the Overtime Hours – Fatigue and Intershift Recovery Relationships

	Chronic fatigue		Acute fatigue		Intershift recovery	
Predictor	*B*	95% CI	*B*	95% CI	*B*	95% CI
Constant	50.70***	[48.10, 53.29]	53.46***	[51.39, 55.54]	50.39***	[48.25, 52.53]
OH	0.52*	[0.10, 0.94]	0.45**	[0.12, 0.78]	-0.41*	[-0.75, -0.07]
VO	-0.76***	[-1.16, -0.37]	-1.17***	[-1.48, 0.85]	0.18	[-0.15, 0.51]
OH × VO	-0.07*	[-0.13, -0.01]	-0.05*	[-0.10, -0.004]	0.06*	[0.01, 0.11]

LVO	0.97**	[0.42, 1.51]	0.80***	[0.36, 1.23]	-0.78 **	[-1.23, -0.34]
MVO	0.52*	[0.10, 0.94]	0.45**	[0.12, 0.78]	-0.41*	[-0.75, -0.07]
HVO	0.07	[-0.54, 0.69]	0.10	[-0.39, 0.60]	-0.04	[-0.55, 0.47]

Note. CI = confidence interval. OH = overtime hours. VO = voluntary overtime. HVO = high voluntary overtime. MVO = moderate voluntary overtime. LVO = low voluntary overtime.
R^2 = .107, Δ R^2 = .016 for chronic fatigue; R^2 = .225, Δ R^2 = .013 for acute fatigue; R^2 = .052, Δ R^2 = .018 for intershift recovery.
*p < .05. ** p < .01. *** p < .001.

In terms of WFC and job-related outcomes, Table 5.33 indicated that the interaction effect of overtime hours with voluntary overtime significantly added to the explanation of WFC, R^2 = .121, Δ R^2 = .023, F(1, 261) = 6.83, p = .009, 95% CI [-0.05, -0.01]; job satisfaction, R^2 = .412, Δ R^2 = .026, F(1, 261) = 11.70, p = .001, 95% CI [0.01, 0.02]; and work engagement, R^2 = .440, Δ R^2 = .027, F(1, 261) = 12.54, p < .001, 95% CI [0.02, 0.07]. Furthermore, the conditional effects showed that overtime hours was significantly related to WFC when voluntary overtime was 6.63 standard deviations below the mean (B = 0.43, p < .001) and at the mean (B = 0.23, p = .004), but not when voluntary overtime was 6.63 standard deviations above the mean (B = 0.03, p = .788). Overtime hours was significantly related to job satisfaction and work engagement when voluntary overtime was 6.63 standard deviations below the mean (B = -0.08, p = .031; and B = -0.25, p = .031 respectively), but not when voluntary overtime was at the mean (B = 0.01, p = .632; and B = 0.05, p = .559 respectively); it was interesting that overtime hours was significantly positively related to job satisfaction and work engagement when voluntary overtime was 6.63 standard deviations above the mean (B = 0.11, p = .011; and B = 0.35, p = .007 respectively).

Furthermore, the Johnson-Neyman significance region showed the positive relationship between overtime hours and WFC was significant when voluntary

overtime was greater than 2.05 standard deviations below the mean but not significant with higher values of voluntary overtime. Additionally, the negative relationships between overtime hours with job satisfaction and work engagement were significant when voluntary overtime was greater than 5.84 and 5.85 standard deviations respectively below the mean; the relationships between overtime hours with job satisfaction and work engagement became significantly positive when voluntary overtime was greater than 3.82 and 3.34 standard deviations respectively above the mean.

In addition, the binary logistic regression analysis was conducted and displayed that the interaction effect of overtime hours with voluntary overtime did not significantly add to the explanation of turnover intention, R^2 = .064, Δ R^2 = .007, χ^2 (1) = 1.60, p = .206. Overall, Hypothesis 8c was mostly supported: voluntary overtime moderates the relationships between overtime hours and depression, anxiety, stress, overall mental health, chronic fatigue, acute fatigue, recovery, WFC, job satisfaction and work engagement, but not in terms of turnover intention.

Table 5.33 Coefficients for Voluntary Overtime as a Moderator of the Overtime Hours – WFC, Job Satisfaction and Work Engagement Relationships

	WFC		Job satisfaction		Work engagement	
Predictor	*B*	95% CI	*B*	95% CI	*B*	95% CI
Constant	27.10***	[26.13, 28.07]	14.92***	[14.57, 15.27]	26.98***	[25.90, 28.06]
OH	0.23**	[0.07, 0.39]	0.01	[-0.04, 0.07]	0.05	[-0.12, 0.23]
VO	-0.27***	[-0.42, 0.13]	0.34***	[0.29, 0.39]	1.12***	[0.95, 1.28]
OH × VO	-0.03**	[-0.05, -0.01]	0.01**	[0.01, 0.02]	0.05***	[0.02, 0.07]
LVO	0.43***	[0.23, 0.63]	-0.08*	[-0.15, -0.01]	-0.25*	[-0.47, -0.02]
MVO	0.23**	[0,07, 0.39]	0.01	[-0.04, 0.07]	0.05	[-0.12, 0.23]
HVO	0.03	[-0.20, 0.26]	0.11*	[0.03, 0.19]	0.35**	[0.10, 0.61]

Note. CI = confidence interval. OH = overtime hours. VO = voluntary overtime. HVO = high voluntary overtime. MVO = moderate voluntary overtime. LVO = low voluntary overtime.
R^2 = .121, Δ R^2 = .023 for WFC; R^2 = .412, Δ R^2 = .026 for job satisfaction; R^2 = .440, Δ R^2 = .027 for work engagement.
*p < .05. ** p < .01. *** p < .001.

5.4 Discussion

5.4.1 Summary of Findings

This study aimed to test the hypotheses put forward in the introduction. Firstly, this study found overtime hours were significantly correlated with elevated chronic fatigue, acute fatigue, WFC and decreased intershift recovery, and this present study did not find the significant correlations between overtime hours and depression, anxiety, stress, overall mental health, job satisfaction, turnover intention and work engagement. Furthermore, key findings are illustrated below.

Firstly, figure 5.25 shows that ERI, WTC, involuntary and voluntary overtime accounted for significant explanation in mental health, WFC and job-related outcomes and also shows the significant relationships between ERI and WTC with involuntary and voluntary overtime. Sections from 5.4.1.1 to 5.4.1.4 present the results in detail.

Figure 5.26 further indicates the mediating effects of involuntary overtime on relationships between ERI and outcome variables as well the meditating effects of voluntary overtime on relationships between WTC and outcome variables, which were discussed in detail in section 5.4.1.5.

In addition, figure 5.27 displays the moderating effect of ERI, WTC and voluntary overtime on overtime hours – outcomes individually, which were discussed in detail in section 5.4.1.6.

Figure 5.25 Explanatory Effects of ERI, WTC, Involuntary and Voluntary Overtime on Mental health, WFC, and Job-related Outcomes

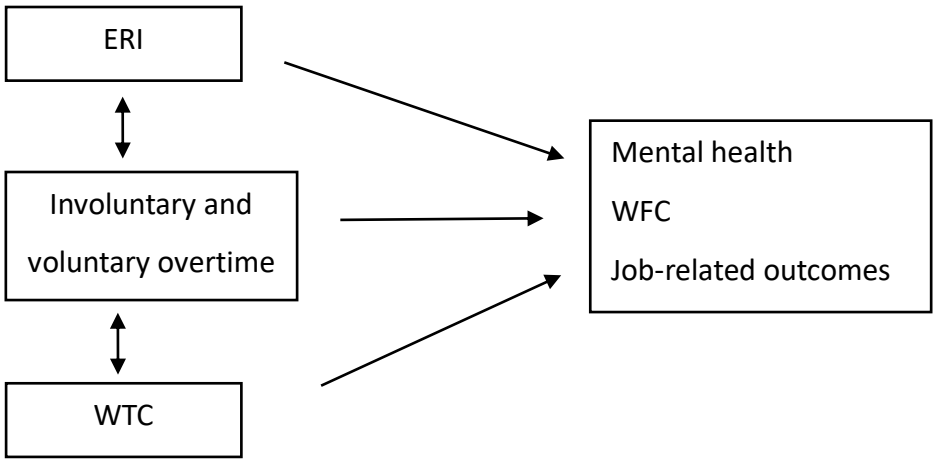


Figure 5.26 Mediating Effects of Involuntary and Voluntary Overtime

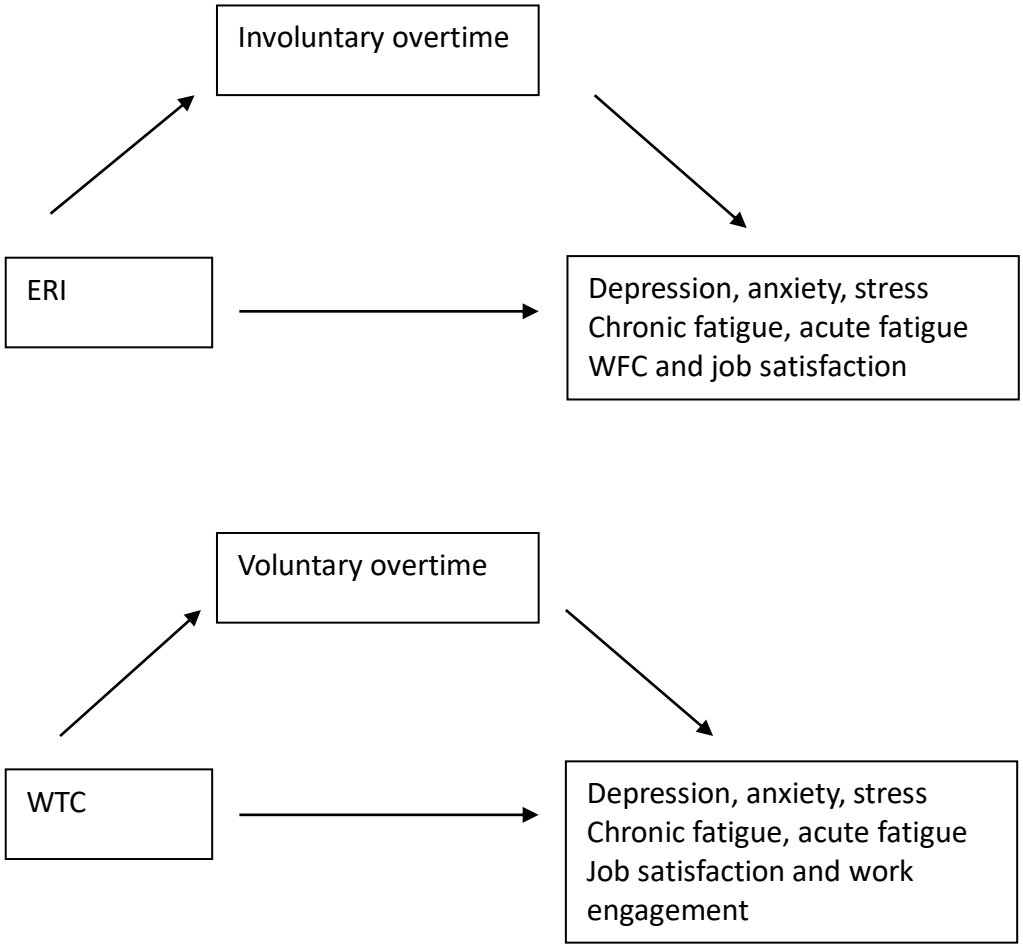
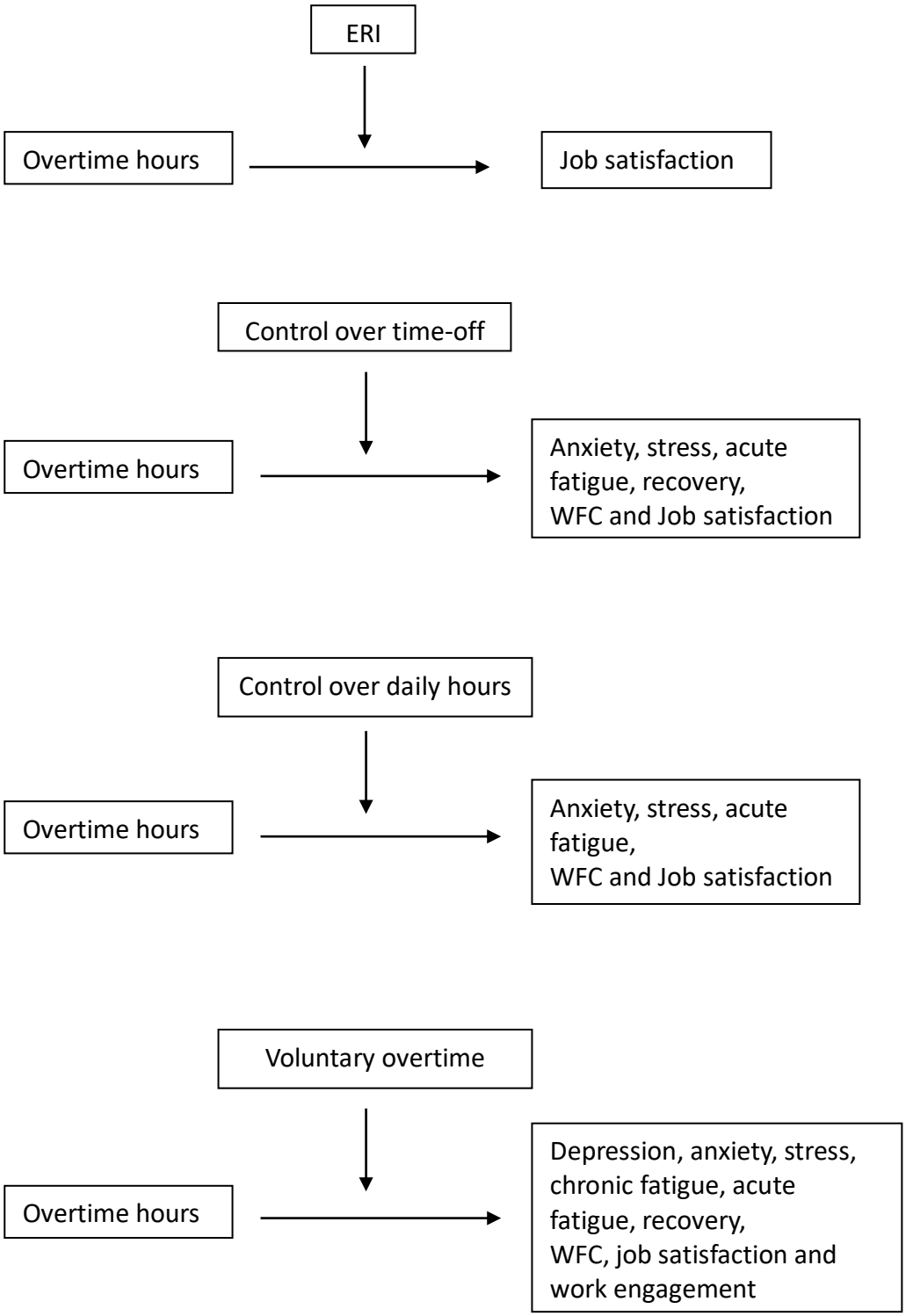


Figure 5.27 Moderating Effects of ERI, WTC and Voluntary Overtime



5.4.1.1 The Influence of Reward

In terms of reward, employees who did not receive compensation for overtime seemed to suffer significantly higher stress and bad recovery than employees who received compensation for overtime, whilst, it did not seem to differ significantly in depression, anxiety, chronic fatigue, acute fatigue, WFC, job satisfaction, turnover intention and work engagement. Moreover, compared to employees who felt they were not rewarded adequately in terms of their effort invested at work, adequately rewarded employees experienced significantly lower depression, anxiety, stress, chronic fatigue, acute fatigue, WFC, turnover intention whilst also having higher job satisfaction and work engagement. In addition, controlling for some personal characteristics, ERI contributed significantly to overtime employees' depression, anxiety, stress, chronic fatigue, acute fatigue, WFC, job satisfaction, turnover intention and work engagement. However, this study did not find the significant explanatory effect of ERI on intershift recovery and the significant difference between effort more than reward and effort less than or equal to reward in intershifit recovery.

5.4.1.2 The Influence of WTC

In terms of WTC, on the one hand, in terms of control over time-off, this study found employees within moderate or high control over time-off experienced significantly lower depression, anxiety, stress, overall mental health problems, chronic fatigue, acute fatigue, WFC, turnover intention and higher intershift recovery, job satisfaction and work engagement than employees within low control over time-off. Moderate or high control over time-off seemed to have a significant influence on female employees in depression, overall mental health, chronic fatigue, acute fatigue, WFC, job satisfaction and turnover intention than male employees. Moderate or high control over time-off also appeared to have a significant influence on employees who had dependents in depression, anxiety, stress, and overall mental health than employees who did not have dependents.

On the other hand, regarding control over daily hours, employees within moderate or high control over daily hours experienced significantly lower depression, anxiety, stress, overall mental health problems, chronic fatigue, acute fatigue, WFC, and higher intershift recovery, job satisfaction and work engagement than employees within low control over daily hours. This study did not find the significant influence of control over daily hours on turnover intention. High control over daily hours seemed to exert a significant influence on female employees in WFC, job satisfaction and turnover intention than male employees. This study did not find the significant interaction effect between control over daily hours and dependents status.

5.4.1.3 Combination of Reward and WTC

Regarding the combination effect of reward and WTC, this study found the significant interaction effect of reward and WTC on anxiety, overall mental health and job satisfaction. The differences of anxiety, mental health and job satisfaction between effort more than reward and effort less than equal to reward in participants within low WTC were significantly bigger than the differences in participants within moderate or high WTC. The interaction effect would imply that the difference of anxiety, mental health and job satisfaction between effort more than reward and effort less than or equal to reward depends on the levels of WTC. Adequate rewards seemed to have a greater influence on employees who had low WTC than employees who had moderate or high WTC in anxiety, overall mental health and job satisfaction.

5.4.1.4 The Influence of Voluntary and Involuntary Overtime

Involuntary overtime was significantly correlated with increased depression, anxiety, stress, chronic fatigue, acute fatigue, bad intershift recovery, WFC, turnover intention, decreased job satisfaction and reduced work engagement, whereas voluntary overtime was found to have the opposite significant correlations with these outcome variables except intershift recovery.

Furthermore, the regression analyses indicated that involuntary overtime (due to workload and conformity) and voluntary overtime (due to extrinsic and intrinsic motivation) exert different influences on outcome variables: conformity and intrinsic motivation seemed to have significant influences on depression, anxiety, overall mental health; workload, conformity and intrinsic motivation seemed to have significant influences on stress, chronic fatigue, acute fatigue; intrinsic motivation may benefit intershifit recovery; involuntary overtime (including workload and conformity) was found to significantly add to the explanation of WFC whereas voluntary overtime was not found the significant influence; workload, conformity, extrinsic and intrinsic motivation significantly added to the explanation of job satisfaction; workload, extrinsic motivation and intrinsic motivation significantly affected work engagement; workload and intrinsic motivation affected turnover intention.

Involuntary overtime positively correlated with ERI ratio and negatively correlated with WTC; voluntary overtime negatively correlated with ERI ratio and positively correlated with WTC. Extrinsic motivation and intrinsic motivation significantly added to the explanation of ERI ratio and accounted for 26.7% variance in ERI ratio. ERI and WTC significantly influenced voluntary overtime and ERI significantly influenced involuntary overtime, namely the lower the effort-reward imbalance ratio and the higher the WTC are, the higher the voluntary overtime is and the higher the effort-reward imbalance ratio is, the higher the involuntary overtime is.

5.4.1.5 The Mediation Effect of Involuntary Overtime and Voluntary Overtime

Involuntary overtime functioned as a mediator on the relationship between ERI ratio and depression, anxiety, stress, overall mental health, chronic fatigue, acute fatigue, WFC, job satisfaction. This study did not find the significant mediating effect of involuntary overtime on the relationship between ERI

ratio with intershift recovery and work engagement. Additionally, voluntary overtime acted as a mediator in the relationship between WTC and depression, anxiety, stress, overall mental health, chronic fatigue, acute fatigue, job satisfaction and work engagement. This study did not find the significant mediating effect of voluntary overtime on the relationship between WTC with recovery and WFC.

5.4.1.6 The Moderation Effect of ERI, WTC and Voluntary Overtime

In terms of the moderation effect of ERI, WTC and voluntary overtime, ERI moderated the relationship between overtime hours and job satisfaction; control over time-off significantly moderated the relationships between overtime hours and anxiety, stress, overall mental health, acute fatigue, intershift recovery, WFC, job satisfaction; control over daily hours moderated the relationship between overtime hours and anxiety, stress, overall mental health, WFC and job satisfaction; voluntary overtime significantly moderated the relationships between overtime hours and depression, anxiety, stress, overall mental health, chronic fatigue, acute fatigue, intershift recovery, WFC, job satisfaction and work engagement. This moderation effects indicate that the effect of overtime hours on outcome variables depends on the levels of control over time-off, control over daily hours and voluntary overtime.

5.4.2 Comparisons to Previous Research

In terms of the associations between overtime and outcomes investigated in this research, this study did not indicate the significant correlations between overtime hours and increased mental health problems, including depression, anxiety, stress and overall mental health, which was consistent with some previous research findings that indicate overtime work does not appear sufficiently associated with mental ill health. A Japanese study found no association between long working hours and mental disorders by exploring the employee insurance company records (Tarumi et al., 2003). Another study

with a 24-year follow-up did not find any association between “overtime work” and incidence of depressive disorders (Michelsen & Bildt, 2003). However, the evidence for the relationship between overtime and mental health is still controversial and inconsistent as several previous researches also indicated the associations between overtime and mental health problems. Nishikitani, Nakao, Karita, Nomura, and Yano (2005) found overtime work was associated with depression and physical complaints. Kleppa et al. (2008) indicated that overtime workers had significantly higher prevalence of anxiety and depressive disorders compared with those working normal hours. These inconsistencies demonstrate that the influence of overtime on employees’ mental health is not simple and therefore more research is needed to explore the relevant psychosocial factors affecting their relationships.

In addition, this study found the associations between overtime and chronic fatigue, acute fatigue and poor intershift recovery, which aligns with ample previous findings. Through investigating a national sample of Sweden, Åkerstedt et al. (2002) found overtime work as a predictor of fatigue. Another study indicated that long working hours as a chronic job stress leads to cumulative fatigue. Compared with less longer working hours group, longer and more longer working hour groups reported significantly higher the rate of complaints of subjective fatigue before going to work (Jungsun et al., 2001). Overtime not only leads to more effort investment but also less time for recovery after work further inducing fatigue (Meijman et al., 1998). This study also indicated that overtime work correlated with elevated WFC which is consistent with previous research findings (e.g. Grzywacz & Marks, 2000; Hämmig & Bauer, 2009; Jansen et al., 2004). High time-related job demands were found to be a major antecedent of work-to-conflict (Brauchli et al., 2014). It is evidential to suggest an association between overtime and WFC.

Moreover, this current study did not find the significant associations between overtime and some job-related outcomes, including job satisfaction, turnover intention and work engagement, which is consistent with previous findings

indicating that overtime is not consistently associated with poor job-related outcomes (e.g. Beckers et al., 2008; Huang, Lawler, & Lei, 2007; McNall, Masuda, & Nicklin, 2009). It may be that only extreme long working hours was associated with job dissatisfaction (Artazcoz, Cortès, Escribà-Agüir, Cascant, & Villegas, 2009). The insignificant associations may be on account of work-related conditions related to overtime. Low job satisfaction was related to long working hours when workers were involuntarily engaged in the overtime work (Beckers et al., 2008; Otterbach, Fok, et al., 2016). Overtime work would not induce turnover intention if the work environment is not stressful (Sousa-Poza & Henneberger, 2004). However, in terms of work engagement, to the author's knowledge, there is scarce preceding research investigating the influence of overtime on work engagement.

Therefore, even though there is currently sufficient evidence to raise concerns about the risks to health and job-related outcomes of long working hours, the level and nature of those risks are still not clear. In the situation of long hours of overtime, overtime work may act as a predictor of major depressive episode (Virtanen et al., 2012). Moderate overtime may be not a problem for psychosomatic health (Van Der Hulst & Geurts, 2001). Another study suggests that overtime work might only be related to health problems under adverse psychosocial working conditions (Van Der Hulst & Geurts, 2001). The results of current research suggests how deleterious psychosocial working conditions can lead to job stress as well as other adverse outcomes as a result of an imbalance between high effort spent and low reward received at work, which is consistent with Siegrist (1996)'s findings; or a discrepancy between high job demands and low job control which supports Karasek and Theorell (1990)'s findings. With regards to specific hypotheses, the following section discusses three psychosocial factors related to overtime that potentially affect the outcomes of overtime.

5.4.2.1 Adequate Reward is Associated with Less Adverse Outcomes

Firstly, this study indicates that rewards could meliorate the influence of overtime on employees as findings in the present research showed employees who had adequate reward reported lower mental health issues, WFC and better job-related outcomes compared with inadequate rewarded employees, in line with findings in the literature (e.g. Stansfeld & Candy, 2006; Van Vegchel et al., 2001). Specifically, the predictive power of ERI model has been substantiated in numerous studies examining various outcomes, including depression (e.g. Kikuchi et al., 2009; Tsutsumi et al., 2012; von dem Knesebeck & Siegrist, 2003), anxiety (e.g. Calnan et al., 2000), stress (e.g. Calnan, Wadsworth, May, Smith, & Wainwright, 2004; Calnan et al., 2000; Kinman & Jones, 2008a), fatigue (e.g. Takaki, Nakao, Karita, Nishikitani, & Yano, 2006; Wada et al., 2008), work-life conflict (e.g. Hämmig et al., 2012; Kinman & Jones, 2008b); job satisfaction (e.g. Janssen, 2001; Mark & Smith, 2012; Mottaz, 1985), turnover intention (e.g. Derycke et al., 2010; Farrell & Rusbult, 1981; Panatik et al., 2012) and work engagement (e.g. Maslach & Leiter, 2008).

An imbalance between high effort and low reward was perceived as stressful experiences at work. This imbalance is not uncommon in high competition working life, in particular among employees who have no alternative choice in the labour market or who have strong labour relations with organization, e.g., permanent labour contract, and therefore, even though employees perceive imbalance at work, they may continue staying in the workplace (Siegrist, 1996). The long-term imbalance elicits recurrent stress and adverse emotions of anger and may have a profound impact on employees' mental health (von dem Knesebeck & Siegrist, 2003).

In addition, there is concern that the impact of ERI on WFC remains under-investigated and restricted and previous findings may have failed to provide sufficient evidence. There is very limited literature on the effect of ERI on WFC, except Kinman and Jones (2008b), who stated that the stressful

experience of imbalance between effort invested and reward received at work is likely to extend to the life, which will be undergone more frequently by employees who are highly committed to their work. The findings of this study about the ERI-WFC association added the further evidence to the effect of ERI on WFC, but there is still considerable scope to add to this line of research. For example, future research may consider exploring the nature or process how ERI may influence WFC.

As found in the ERI-job-related outcomes associations literature, ERI in this present study is also relevant in the influence of job satisfaction, turnover intention and work engagement. Employees felt unsatisfied about their jobs when they devoted into longer hours overtime working and put more investment at work but received unequal reward. The recurrent imbalance boosts employees' turnover intention or less engagement at work (Farrell & Rusbult, 1981; Maslach & Leiter, 2008). The job demand – resources model (JDR) conceptualizes reward, control and support as potential ways to alleviate emotional exhaustion and boost job satisfaction (Lewig & Dollard, 2003). Job resources facilitate work engagement particularly when job demands are high (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007), whereas a lack of reciprocity or imbalanced social exchange process may induce burnout at work (Schaufeli, Dierendonck, & Gorp, 1996).

The cultural or organizational environment may influence employees' concepts and behaviour in the workplace (Stone-Romero, Stone, & Salas, 2003). The Chinese culture roots of Confucianism, a traditional Chinese philosophy, influences the work-related values, including collectivism, hardworking, endurance and harmonious social relationships (*guanxi*) that are still prevalent in organizations in Chinese societies (Kudielka*, Von Känel, Gander, & Fischer, 2004). A conflicting condition in the workplace may exist that employees perceive the actual situation of imbalance between effort invested and reward received, but they still engage in overtime work which may be influenced by the deep-rooted culture, for example, employees

should commit themselves to their group and organization, such which situation may be predictive to emotional dissonance and exhaustion, deteriorate mental health problems related to overtime and put employees in a prolonged exposure to stress at work.

5.4.2.2 Moderate or High WTC is Associated with Less Adverse Outcomes

Secondly, in terms of WTC, this current study found control over time-off and control over daily hours significantly affected mental health, fatigue, WFC, job satisfaction and work engagement which are consistent with previous studies and adds further evidence for previous literature. Nijp et al. (2012)'s systematic review on the association between WTC and work-non-work balance, health and well-being and job-related outcomes suggested strong cross-sectional evidence for positive associations between WTC and both work-non-work balance and job-related outcomes, whereas no consistent evidence for well-being.

In terms of WFC, there is a relatively consistent finding in preceding researches (e.g., Gerstel & Clawson, 2018; Jansen et al., 2004; Tucker & Rutherford, 2005; Valcour, 2007), whereas the evidence for mental health and job-related outcomes is inconsistent and limited. Regarding health, this study indicated that individuals within high or moderate control over time-off or daily hours reported less mental health problems (including depression, anxiety and stress), and fatigue (chronic and acute) and high intershift recovery than those within low control over time-off or daily hours. The result of stress is in line with previous findings that reported significant negative association between WTC and stress (e.g. Ala-Mursula, 2006; Bakker et al., 2007; Fenwick & Tausig, 2001; Tsutsumi et al., 2012), whereas the result of fatigue is inconsistent with limited findings of previous studies that reported no association between WTC and fatigue (e.g. Schaufeli et al., 1996; Tsutsumi et al., 2002); to the author's knowledge, there is limited research investing the

relationship between WTC and anxiety. This research filled up the gap and further studies are needed to demonstrate the findings.

Moreover, the costs are thought to be reversible, as long as the individual has sufficient autonomy on worktime, both leave-off and daily hours. However, if there is less control over worktime, then negative load effects may accumulate, resulting in elevated mental health issues. Lack of WTC enables insufficient opportunity for recovery from work, then negative load effects may accumulate, resulting in prolonged fatigue and, eventually, poorer health (Geurts et al., 2003; van der Hulst & Geurts, 2001). To the author's knowledge, there has been insufficient evidence for the association between WTC and work engagement, except one Hornung, Rouseau, Glaser, Angerer, and Weigl (2011) reported there was no association between WTC and work engagement.

In addition, this study found that control over time-off seemed to have higher influence on female than male in mental health, WFC and job-related outcomes, and control over daily hours in WFC and job-related outcomes, which is in line with previous literature. The majority of researchers indicated that although gender gap has been diminished over the last few decades, women still engage in more domestic work than men, feel more stressful to balance working hours and time spent in unexpected family responsibilities (Bianchi, Sayer, Milkie, & Robinson, 2012; Gerstel & Clawson, 2018; Maume, 2016). Therefore, it is not hard to understand worktime flexibility greatly benefit women. Moreover, this study further found that control over time-off had significant impact on employees who had dependents than those who did not. Women who were provided with worktime flexibility seemed to higher commit themselves to their organization and have higher job satisfaction than women who were not. Worktime flexibility were also related to higher organizational commitment and job satisfaction for those having family responsibilities (Scandura & Lankau, 1997).

The above findings suggest the possible buffering effect of reward and WTC on overtime related outcomes in this research. However, to date, there has been little investigation of interactive effects (Van der Hulst, 2003). A new finding of this current research is the combined effect of WTC and rewards was even more pronounced and also the interaction effect of reward and WTC was significant on anxiety, overall mental health and job satisfaction. Compared to employees within moderate or high WTC, adequate reward seems much more important and necessary for those within low WTC. The JD-R model can be used to illustrate these findings. As overtime work comes with more job demands, the likelihood of an employee perceiving inequality increases when they perceive less job resources, whereas high job resources tent to prevent the possibility of the inequality (Rayton & Yalabik, 2014). When overtime employees were in low control of worktime, adequate reward offered by the organization could mitigate the adverse impacts of overtime and compensate the shortage of other resources. Lack of worktime flexibility however adequate reward offered is likely to diminish overtime employees' anxiety and increase their job satisfaction.

5.4.2.3 Voluntary Overtime is Associated with Less Adverse Outcomes

In addition to reward and WTC, this research identified anther important overtime-related characteristic in relation to mental health, WFC and job-related outcomes, namely involuntary & voluntary overtime. Involuntary overtime was correlated with increased mental health problems, WFC and poor job-related outcomes whereas voluntary overtime was correlated with decreased mental health problems, WFC and improved job-related outcomes. These findings are in line with limited findings of previous studies. Golden and Wiens-Tuers (2005) suggested that involuntary overtime was likely to impair well-being, induce work-family interference and low job satisfaction. Ota et al. (2005) found that involuntary overtime work was associated with relatively high fatigue and low job satisfaction whereas voluntary overtime workers were non-fatigued and satisfied. In a similar vein, Van Der Hulst and Geurts

(2001) indicated that a high pressure to work overtime in combination with low rewards was associated with elevated risks of poor recovery, cynicism and negative work-home interference and in low reward situations, even a limited number of hours of involuntary overtime would induce adverse mental health problems.

Furthermore, based on Watanabe and Yamauchi (2016), who identified each two dimensions of involuntary overtime and voluntary overtime, namely workload, conformity; extrinsic motivation and intrinsic motivation, another new finding of this study is the impact of these dimensions on mental health, WFC and job-related outcomes. Conformity and intrinsic motivation exert significant and oppose influences on employee' mental health and fatigue. Pressures could be not only from workload, but also from other persons, such as managers, which involuntary overtime work generate from (Tucker & Rutherford, 2005; Van Der Hulst & Geurts, 2001). Employees may suffer elevated ill mental health and fatigue when they work overtime in order to meet cultural or organizational custom or others' expectation, whereas if employees are intrinsically motivated to engage in overtime work, they may suffer less mental health troubles and fatigue. Employees who have to engage in longer hours work beyond their intention are much more easily to experience fatigue than those who are internally willing to and motivated to work long hours (Beckers et al., 2008). Additionally, undertaking overtime work due to workload puts employees in a much more stressful psychological and physical situation.

Furthermore, involuntary overtime negatively influences WFC, consistent with previous literature (Ala-Mursula et al., 2002; Golden & Wiens-Tuers, 2005, 2006; Nijp et al., 2012; Tucker & Rutherford, 2005; Van Der Hulst & Geurts, 2001). Involuntary overtime due to both workload and conformity is likely to have an adverse impact on job satisfaction whereas voluntary overtime has the reverse impact, which aligns with the limited previous research (Beckers et al., 2008; Golden & Wiens-Tuers, 2005). However, in terms of work

engagement and turnover intention, to the author's knowledge, this is the first study quantitatively investigating the relationships with involuntary & voluntary overtime. Intrinsic motivation and extrinsic motivation stimulate work engagement whereas involuntary workload hinders employees' work engagement. Intrinsic motivation may decrease employee's turnover intention whereas involuntary overtime may increase turnover intention.

In addition, this research also detected the relationship between involuntary & voluntary overtime with ERI and WTC. In terms of the associations with ERI, it is consistent with limited previous findings, meanwhile the associations with WTC seems to be a new finding. The higher ERI was perceived by employees or the lower WTC employees possessed, the more likely they engaged in higher involuntary overtime, whereas the higher effort-reward balance participants perceived or the higher WTC they had, the more likely they engaged in voluntary overtime. This study further found that extrinsic motivation and intrinsic motivation significantly negatively related to ERI and accounted for 26.7% variance in ERI ratio. This finding links involuntary & voluntary overtime with ERI model. Additionally, this study found reward and WTC indeed facilitate voluntary overtime whereas ERI affected involuntary overtime. These findings are consistent with qualitative findings in Chapter 4 and previous indications. According to Watanabe and Yamauchi (2016), voluntary overtime could be facilitated by extrinsic or intrinsic motivation (e.g., overtime money, passion for job). Tucker and Rutherford (2005) suggested that persons may engage in overtime work for purpose of associated benefits (e.g., higher pay, self-actualization); more hours of work are generally associated with greater income, whereas if efforts invested at work are rewarded with imbalanced compensation, involuntary overtime may occur.

5.4.2.4 Mediation Effect of Involuntary and Voluntary Overtime

This research further showed that it seemed that involuntary overtime as a mediator in the relationships between ERI and mental health, fatigue, WFC,

and job satisfaction and voluntary overtime as a mediator in the relationships between WTC and mental health, fatigue, job satisfaction and work engagement, these of which findings are consistent with findings of the qualitative study discussed in Chapter 4. To the author's current knowledge, as yet there has been no previous research that specifically investigated the mediation effect of voluntary overtime and involuntary overtime.

Long working hours is expected to be compensated with sufficient rewards, whereas if overtime employees perceive the inequity that high investment is not compensated by fair reward, they would not be willing to engage in overtime work and invest further effort. However, if they need to do overtime work, involuntary overtime occurs. It is assumed that a lack of reciprocity but engaging in overtime work involuntarily may elicit distress and low satisfaction (Beckers et al., 2008). A recent study using a representative Spanish data set and a combination of extrinsic effort and intrinsic effort from ERI model, showed that involuntary effort and voluntary effort cause different consequences for workers: involuntary effort increases workers' stress and fatigue, whereas voluntary effort reduces these phenomenon (Ollo-López, Bayo-Moriones, & Larraza-Kintana, 2014).

In terms of the mediation effect of voluntary overtime in the relationship between WTC and outcomes, time management from job demand-control (JDC) model could be used to illustrate this finding. Time management behavior, a source of decision latitude, positively affects employees' psychological health (Peeters & Rutte, 2005). It may be that WTC gives employees more flexibility and autonomy on when to conduct overtime work and therefore facilitates voluntary overtime that further causes less antipathy, cynicism and emotional exhaustion towards overtime and induces less adverse influences. High WTC enables employees to schedule their working hours and at the same time arrange their overtime work according to their current and actual situation, which arouses the impetus for the work and

collision avoidance. As the overtime work is planned by themselves; accordingly, they are more likely to engage in voluntary overtime work.

However, it is worth noting that as yet the measurement of involuntary & voluntary overtime has been limited and inconsistent. There has been scarce research quantitatively investigated involuntary & voluntary overtime; to the author's knowledge, only two studies measured involuntary & voluntary overtime. One is Beckers et al. (2008)'s study that voluntary or involuntary was measured based on three items, namely: (1) ''I work overtime because I want to''; (2) ''I work overtime because my supervisor wants me to''; (3) ''I work overtime because my colleagues expect me to.'' Overtime work was classified as purely voluntary when respondents answered ''yes'' to item (1) AND ''no'' to items (2) and (3). Oppositely, respondents were classified as purely involuntary overtime workers when they responded ''yes'' to items (2) or (3) AND ''no'' to item (1). Finally, employees who responded ''yes'' to item (1) AND ''yes'' to (2) and/or (3) were classified as employees who work partly voluntary and partly involuntary overtime work. Three items were also added assessing other major reasons for overtime work, namely work enjoyment (''I work overtime because I enjoy my work''), high workload (''I work overtime to finish my work''), and reward opportunity (''I work overtime because it gains me something, e.g., money/recognition/promotional opportunities'').

The second study that measures involuntary and voluntary overtime is one by Watanabe and Yamauchi (2016), who explored involuntary & voluntary overtime from each two dimensions individually, workload and conformity for involuntary overtime; extrinsic motivation and intrinsic motivation for voluntary, which was the starting point for developing the current research. Items in these two studies are comparable: they both looked at overtime work with respect to workload and reward. Additionally, the intrinsic motivation was referred to in both studies. The difference is that in the former study, they judged involuntary & voluntary mainly by the decision latitude by overtime employees themselves or others. The latter study judged

involuntary overtime not only from conformity but also from workload. However, despite some discrepancies, according to Beckers et al. (2008), overtime work cannot always be recognized explicitly as "involuntary" or "voluntary". There may be a gray area between voluntary and involuntary overtime work that is hard to define. Therefore, the measurement of voluntary and involuntary overtime is based on the combination of previous research findings and qualitative study findings in this current research.

5.4.2.5 Moderation Effect of Reward, WTC and Voluntary Overtime

Firstly, this study found the moderation effect of effort-reward balance on the relationship between overtime hours and job satisfaction, which is consistent with previous literature (Janssen, 2001; Mustapha, 2013; Van Vegchel et al., 2005). According to Adams (1965)'s equity theory, employees seek to maintain fairness between the efforts that they invest at work and the rewards that they receive, which could be seen as an exchange process. Perceptions of balance between efforts and rewards reinforce employees' positive job responses and therefore they are willing to undertake a properly rewarded job. This balanced job situation increase employees' feelings of regulation and management in their occupational life further motivating job satisfaction (Dittrich & Carrell, 1979; Mowday, 1991). Overtime hours implying extra inputs at work, if employees perceive proper rewards compensated, they are likely to experience gratification towards their job; vice versa, if the extra efforts were not compensated with equal rewards, dissatisfaction would occur.

In addition, this study found the moderating effect of control over time-off and control over daily hours on the relationships between overtime hours and anxiety, stress, WFC and job satisfaction, which is consistent with previous literature (Beutell, 2010; Häusser, Mojzisch, Niesel, & Schulz-Hardt, 2010; Jang, Park, & Zippay, 2011; Moen et al., 2016; Taris, 2006). The time-regulation model and JD-R model can serve as useful theoretical frameworks for

understanding the mechanisms underlying the effect of WTC on the relationship between overtime and those outcomes. Long hours' overtime work put employees in a stressful working environment whereas worktime autonomy enables employees to adjust their work schedule according to their current mental status and further reduce anxiety and stress to a lesser extent.

Additionally, high WTC facilitates the efficient responsibility distribution towards work and family. Hughes and Parkes (2007) indicated that WTC moderated the association between work hours and work-family interference. WTC enabling employees acquire greater competencies to control their working time, leads to greater satisfaction (Barling, Kelloway, & Iverson, 2003). Arrangements for worktime flexibility is therefore considered as an important method of reducing stress (Tucker & Rutherford, 2005), balancing work and other responsibilities in family (Russell, O'Connell, & McGinnity, 2009), and improving job satisfaction (Kinzl et al., 2005). Moreover, this study also found the moderating effect of control over time-off on the relationships between overtime hours with acute fatigue and intershift recovery. These results principally confirm the findings of previous researches (Takahashi et al., 2011, 2012; Tucker et al., 2015). This study thus provides additional evidence to validate the beneficial function of WTC with respect to the mental health, and also in particular the role of control over time-off in fatigue and intershift recovery.

Another new finding is that voluntary overtime moderated the relationship between overtime hours and mental health, fatigue, intershift recovery, WFC, job satisfaction and work engagement. To the author's knowledge, there is no previous research specifically investigating the moderating effect of voluntary overtime on overtime work with respective to related outcomes, even though we have discussed compared with involuntary overtime, voluntary overtime causes less detrimental influences on employees' mental health, WFC and job-related outcomes. These new findings further indicate that the influence of overtime hours on these outcomes depending on the levels of voluntary

overtime. In particular, this study found that the significant adverse influences of overtime hours on mental health, fatigue, WFC and job-related outcomes were only on the condition that voluntary overtime is low, and conversely, when the voluntary overtime was high, the influences of overtime hours on stress, overall health, job satisfaction and work engagement became positive.

Additionally, these findings are consistent with results discussed in qualitative study in Chapter 4 that employees would have a feeling of accomplishment after the voluntary overtime work done; if the overtime is compensated with sufficient rewards, employees are likely to work overtime voluntarily and experience less fatigue and higher job satisfaction. This could be illustrated by the intrinsic and extrinsic motivation theories. One comprehensive theoretical framework, self-determination theory (SDT) (Deci & Ryan, 1985; Ryan & Deci, 2000), explicitly claims that individuals are motivated by three basic psychological needs: for competence, relatedness and autonomy. The satisfied self-determination needs yield self-motivation and mental health. When employees have the autonomy on overtime work and conduct it motivated by intrinsic motivation, they would be proactive and engaged, and the adaptive development and well-being are promoted.

5.4.3 Strengths and Limitations

This research provides more insight into the relationship between overtime and mental health, WFC and job-related outcomes by paying more attention to the psychosocial work characteristics associated with overtime. A strength of this study is that it investigated reward from two different ways, namely specific reward or compensation for overtime work and the perceived imbalance between reward received and effort invested at work that provides a comprehensive understanding of the impact of reward on overtime influences. This research found compensation for overtime work appeared to only make significant differences in stress and intershift recovery whereas effort-reward balance significantly decreased variance negative influences

associated with overtime at work. Furthermore, well-known sub-dimensions of WTC were investigated that facilitated the understanding of separate effect of control over time-off and control over daily hours. In contrast to traditionally focusing on ERI and WTC separately, the present cross-sectional study provides evidence by studying the combing and interacting effect of ERI and WTC on outcomes simultaneously.

In addition, this research explored the potential influence of involuntary & voluntary overtime within individual dimensions that was rarely investigated in previous studies and in particular, to the author's knowledge, no studies in the Chinese context have previously been conducted in this area. This research also generates some evidences for the relationships between involuntary & voluntary overtime and ERI and WTC which provides further understanding of involuntary & voluntary overtime with respective to related work characteristics. However, a potential limitation was the reliance on reported involuntary & voluntary measures. The measurement of involuntary & voluntary overtime was developed based on Watanabe and Yamauchi (2016)'s study and qualitative findings of this research. However, this measurement is not a published questionnaire, and therefore the validity and reliability should be further considered.

Another strength is that ample previous studies usually focused on nurses or physicians in hospitals to date, whereas other occupations lacked attention. This study is one of the few studies, which shed light on the harsh psychosocial working condition of IT services. However, the participants of this research were collected from a mobile communication company in China who cannot be considered as a representative sample of IT employees in China, so caution should be warranted before generalizing the results of this research to wider IT employees' body or other occupations and workplaces.

Moreover, collecting data of various outcomes related to overtime at the same time enabled the analysis of inter-relationships between each variable,

whereas it made the questionnaire relatively long which may have influenced the response rate even though the online questionnaire design allowed the participants to complete a portion of a survey and return later to finish the rest. Furthermore, the cross-sectional design applied in this research makes it difficult to ascertain causal inferences about the associations found, which may be a methodological limitation. Cross-sectional studies generally collect routine data to answer the specific question, whereas confounding factors or other variables that affect the relationship between the putative cause and effect are not included. Cross-sectional studies are generally carried out at on time and give no indication of the sequence of events (Solem & Orthopedics, 2015). We asked people if they had overtime in the previous six months, but we did not have information about their subsequent and earlier overtime information. Therefore, it is normally not possible to establish a cause and effect relationship. Associations identified may be tentative and difficult to interpret. Cautions should be made to generate the findings. Further studies need to be developed that explore the relationships in greater depth.

5.4.4 Implications

The findings of this study highlight the importance of effort-reward balance at work on employees' mental health (including depression, anxiety and stress), fatigue (chronic and acute), WFC and job-related outcomes (including job satisfaction, turnover intention and work engagement). These findings suggest that providing equal rewards to overtime employees to make them perceive effort-reward balance in the job is beneficial not only to employees but also to organizational outputs, such as higher job satisfaction and employee retention. However, the mechanism of explanatory effect of ERI on WFC lacks evidence and is not clear now and therefore further research is needed to pay attention to explore how ERI influences WFC.

In addition, this research indicates the beneficial effects of control over time-off and control over daily hours on elevated mental health, reduced

fatigue, WFC and positive job-related outcomes; control overtime time-off is also likely to decrease overtime employees' turnover intention. Consequently, this research suggests organizations that work time flexibility can be considered as a friendly policy, which positively provides employees the leeway to deal with unexpected problems imposed by fixed schedules (Correll, Kelly, O'Connor, & Williams, 2014). Moreover, WTC seemed to be more important to female overtime employees than male employees, and control over time-off may be beneficial more to overtime employees within dependents, which provides some recommendations for the organization when tailoring relevant policies and undertaking practices in the workplace.

This study also recommends future research to examine WTC comprehensively, that is, to include measurements of employees' need for and access to WTC and assess employees' (mis)match between various dimensions of WTC. For practice, this research suggests introducing WTC on an organizational level and assess employees' need for WTC on an individual basis. Additionally, it is often unclear to which extent employees who report to have access to WTC actually use WTC, which seems to be a prerequisite for beneficial effects to occur (Allen, 2001; Eaton, 2003). Recent research have suggested that although employee flexibility programs are available in the workplace, few employees—across the class spectrum—make use of them because many have the concerns about the negative career repercussions they might face (like bad impression, lower evaluations, and less chances of promotions) (Gerstel & Clawson, 2018). Williams et al. (2013) indicated that the slow spread of flexibility is rooted in cultural resistance and resistance to flexibility is about morality; the use of flexibility may be interpreted by supervisors, co-workers and even employees as a violation of work devotion and lack of morality.

Moreover, according to the findings of the interacting effect of reward and WTC, it suggests organizations that adequate reward appears to be more essential to overtime employees who have low WTC in the influences of

mental health and job satisfaction. Under such situations where worktime flexibility is hard to put into practice in the workplace because of some task-related or time-related reasons, the organization in particular should give overtime employees appropriate rewards and compensation. More research is needed to investigate the combining effect of reward and WTC at work based in both theoretical foundations of ERI model and JD-R model.

This study provides more insight into the relationship between involuntary & voluntary overtime and mental health, fatigue, WTC, job satisfaction and work engagement. The findings of involuntary & voluntary overtime suggest it is important to motivate employees engaging in voluntary overtime and avoid involuntary overtime. Involuntary overtime is likely to induce negative outcomes on mental health, WFC and job-related outcomes. The higher the reward and WTC were, the more likely employees engaged in voluntary overtime. Conversely, employees may fall into involuntary overtime when they experienced imbalance between reward received and effort invested at work (Hallowell, 2010). Combining the results of mediating effect of voluntary overtime on WTC – outcomes relationships and involuntary overtime on ERI – outcomes relationships, findings of this research practically show managers how may effectively make employees motivated and engage in voluntary overtime: perceived balance between effort invested and rewards received and autonomy on work time. However, the measurement for voluntary & involuntary overtime is still limited and not clear. Ota et al. (2005) claimed that overtime work cannot always be recognized explicitly as involuntary or voluntary. There may be a grey area between involuntary and voluntary overtime work that is hard to define. Therefore, more research is needed to explore an accurate, comprehensive and reliable measurement assessing voluntary & involuntary overtime.

Furthermore, reward, WTC and voluntary overtime are important for the influence of overtime hours on job satisfaction. WTC and voluntary overtime are more important for the influence of overtime hours on mental health and

WFC. Voluntary overtime is also important for the influence of overtime hours on work engagement. For the intervention, the provision by organization of worktime flexibility may help to reduce the potential negative impact of long overtime hours on mental health complaints and WFC; facilitating voluntary overtime could protect employees from suffering mental health problems and WFC to a large extent and boost their job satisfaction and work engagement. This recommendation is in particular crucial regarding long overtime working employees, WTC may function as an important work characteristic on reducing adverse impacts of long overtime. The intervention could be tailored depending on the organization's overtime circumstances and individual employee's overtime situation. This can be used as a tool for human resource management improving employee well-being and performance. This contribution concludes with some directions aimed at improving overtime employees' mental health, work-family balance and boosting job-related outcomes and recommendations for future research. Due to the limitation of cross-sectional studies, there is a clear need for well-designed intervention studies to delineate the impact of flexible work time conditions on health, wellbeing, WFC and job-related outcomes.

5.4.5 Conclusion

In conclusion, the reported findings add to cumulating evidence of positive effects of reward and work time flexibility on employees' mental health, fatigue, WFC and job-related outcomes produced by overtime work. These findings suggest that theoretical relationships in the overtime – outcomes developed in the more culturally individualistic West may be adapted into the more collectivist East whereas more research is needed to study larger populations. They also point to the promise of investigating involuntary & voluntary overtime in future research. It is concluded that many of the work-related variables associated with negative influences of overtime work are potentially amenable to change. A variety of protective efforts should be undertaken and evaluated.

This research suggests that organizations can effectively reduce the adverse experience of overtime among their employees. Namely, employees who perceived effort-reward balance, had more flexible schedules and engaged in voluntary overtime reported less mental health complaints, fatigue, WFC and poor job-related outcomes. This suggests that some organizational interventions may be beneficial at reducing distress for employees. Voluntary overtime is suggested as important topics for future research. In order to reduce negative impacts potentially caused by overtime work and increase efficiency, effectiveness, productivity and work engagement of employees, the business must satisfy the needs of its employees by providing good working conditions.

Chapter 6: General Discussion

The purpose of this chapter is to summarise and evaluate the research findings and to illuminate the contributions made by the current research with respect to the aims and hypotheses put forward in Chapter 3. The overall objectives of this thesis were to explore the experiences and salient influences of overtime on employees' mental health, life and job-related outcomes, and to investigate the potential psychosocial factors helping to reduce the deleterious impacts of overtime on employees. This concluding chapter summarises the key findings from this current research, describes strengths and limitations of this thesis and highlights the implications for the development of future interventions to decrease the potential adverse effects of overtime and facilitate overtime employees' mental health, work-family balance and positive job-related outcomes. It also suggests directions for future research.

6.1 Summary of Findings

Phase one consisted of a qualitative study involving one-to-one semi-structured interview with 13 overtime employees in the Chinese IT industry, which described a range of overtime impacts (e.g. mental health complaints, interference with family time and poor job-related outcomes) and provided a rich insight into the overtime employees' experience. Four overarching themes emerged from these interviews involving overtime reasons, outcomes of overtime, potential influential factors associated with overtime, and solutions to overtime challenges. Crucial findings within sub-themes suggested that work-related reasons (e.g. high workload and unexpected interruption) and cultural influences (e.g. impression management) seemed to be more likely to be related to negative impacts whereas personal reasons for overtime (e.g. lack of skills) appeared to cause less resistance and negative emotions; insufficient reward, lack of control over worktime, and involuntary overtime working were identified to exacerbate

the negative influences of overtime on employees; overtime employees held different reward preferences, wherefore rewarding according to employees' preferences and taking employees' needs into account is important and efficient; three categories of potential influences in relation to overtime were generated from participant responses, namely mental health, conflict with life and job-related outcomes; and external social support from organization (e.g. compensation improvement, emotional support) was likely to mitigate the impacts of overtime caused.

Phase two consisted of a quantitative study involving an online questionnaire survey with 265 overtime employees in the Chinese IT industry, exploring the effect of reward, WTC and voluntary and involuntary overtime on outcome variables identified in qualitative study and from the literature review. These outcome variables were mental health (including depression, anxiety and stress), fatigue and intershift recovery, WFC and job-related outcomes (including job satisfaction, turnover intention and work engagement). Overtime hours were correlated with increased chronic fatigue, acute fatigue, WFC and decreased intershift recovery. There were three psychosocial characteristics significantly influenced outcome variables in this research. In terms of reward, this research found that effort-reward balance seems more important than compensation for overtime in influencing mental health, fatigue, WFC and job-related outcomes. In terms of WTC, both control over time-off and control over daily hours are important in affecting mental health, fatigue, WFC and job satisfaction. Additionally, control over time-off seems to have greater impact on female than male and on individuals who have dependents than who do not; control over daily hours seems to have greater impact on female than male. The interaction effect of reward and WTC is significant in terms of anxiety, overall mental health, and job satisfaction, which implies that adequate reward is much more important on employees who have low WTC than employees who have moderate or high WTC.

In addition, this research identified voluntary and involuntary overtime as another potential factor affecting employees' mental health, WFC and job-related outcomes; voluntary overtime was related to positive outcomes whereas involuntary overtime was associated with negative outcomes. Both ERI and WTC accounted for significant variances in voluntary overtime and ERI accounted for significant variance in involuntary overtime. These results found in the quantitative study supported the findings in qualitative study as presented in the model in Figure 4.1. Furthermore, the mediating effect of voluntary and involuntary overtime found in the quantitative study added to the model explaining the specific ways in which WTC influences voluntary overtime which in turn influences employees' depression, anxiety, overall mental health, job satisfaction and work engagement; and how ERI influences involuntary overtime, which in turn influences depression, anxiety, stress, overall mental health, chronic fatigue, acute fatigue, WFC and job satisfaction.

Another notable finding is that the influence of overtime hours on job satisfaction depends on the level of effort-reward balance. Similarly, both control over time-off and control over daily hours buffer the impacts of overtime hours on mental health, WFC and job satisfaction; control over time-off also buffers the relationships between overtime hours and acute fatigue and intershift recovery. Additionally, voluntary overtime was found to moderate the relationships between overtime hours and mental health, fatigue, WFC, job satisfaction and work engagement, such that overtime employees who had long hours' overtime working but felt voluntarily engage in overtime working, seemed to have fewer negative responses. These findings build on Figure 2.1 presented in the Chapter 2 literature review by indicating the specific moderating effect of three moderators (namely WTC, ERI and voluntary overtime) on the relationships between overtime hours and mental health, WFC and job-related outcomes individually. Table 6.1 summarises these moderating effects.

Table 6.1 The Moderating Effect of ERI, WTC and Voluntary Overtime on the Relationships between Overtime Hours and Mental Health, WFC and Job-related Outcomes

Independent variable	Moderators	Outcome variables
Overtime hours	ERI	Job satisfaction
	Control over time-off	Anxiety, stress, overall mental health, chronic fatigue, acute fatigue, recovery, WFC, job satisfaction and turnover intention
	Control over daily hours	Stress, recovery, WFC and job satisfaction
	Voluntary overtime	Depression, anxiety, stress, overall mental health, chronic fatigue, acute fatigue, recovery, WFC, job satisfaction and work engagement

In summary, the results of the two studies combined together suggested that in order to reduce the adverse impacts of overtime on employees' mental health, WFC and job-related outcomes, the organization should improve overtime employees' effort-reward balance, facilitate voluntary overtime and avoid involuntary overtime. In particular, improving WTC for female employees and those who have frequent and high intensity overtime working, as well as facilitating control over time-off especially on those who have dependents been taken care of.

6.2 Strengths and Limitations

The strengths and limitations of the qualitative study and quantitative study have been described in detail within their individual chapters and will not be

repeated in this overall discussion. This section instead reflects on the use of the mixed methods design undertaken in this research.

A qualitative approach was conducted in the first place to explore overtime employees' experiences of overtime and identify the predominant influences of overtime on them. A quantitative approach was then carried out to further investigate the moderating effects of potential psychosocial work characteristics on these outcome variables. The use of mixed methods designs for conducting research has become a major trend in the social science research (Karasek & Theorell, 1990; Tashakkori & Teddlie, 2010). The mixed methods design facilitates a comprehensive understanding of overtime and possibilities intervening overtime influences. This research focused on full time employees who had overtime experience in the previous six months. The purposeful sampling widely used in qualitative data collection with mixed method research (Russell et al., 2009) was particularly effective in the present study because it intends to investigate overtime employees in the Chinese IT industry and identify the phenomenon of interest.

As previously mentioned, most research to date has studied overtime from a quantitative perspective (number of overtime hours worked), however, there are strong indications that it is also the quality of overtime work that counts. A recent study, for example, suggests that overtime work might only be related to health problems under adverse psychosocial working conditions (Van Der Hulst & Geurts, 2001). This research qualitatively explored the psychosocial working conditions related to overtime and further quantitatively investigated the results found in qualitative study. By qualitative study, this research also found the factors contributed to voluntary and involuntary overtime which was scarcely studied in the previous research.

The mixed-methods approach was appropriate for this research, as it provided a comprehensive understanding of overtime influences and possible ways to be considered in exploring the improvement of negative outcomes

related to overtime; it placed attention upon listening to overtime employees 'voices' and self-described experiences involving mental health, work interference with life and job-related outcomes (Dures, Rumsey, Morris, & Gleeson, 2011). The mixed methods approach was particularly effective as it produces the findings of which psychosocial factors may contribute to voluntary overtime and involuntary overtime (e.g. overtime schedule autonomy, high intensity overtime) and how WTC influences voluntary overtime and ERI affects involuntary overtime that further affect employees' mental health, work – family balance and job-related outcomes. These results would not have otherwise found without a mixed methods approach.

However, this mixed-methods design, cross-sectional study, did not permit the establishment of causal relationships between variables. The present study is based on self-reported measures and thus may be affected by issues of common method variance (Hornung et al., 2011; Jansen et al., 2004). However, the transactional view indicates that the potential stress or threat induced by working conditions is dependent mainly on the perceptions and appraisals of the persons themselves, thus the self-report method may be also appropriate for the current research (Hallowell, 2010; Koningsveld; Taris et al., 2011a). It may be worthwhile for further studies to conduct post-hoc statistical tests, such as the confirmatory factor analysis, to detect the influence of common method variance and to understand concepts and applications (Geurts & Sonnentag, 2006). In addition, restrictions about the use of direct language relating to mental health may have influenced the explicitness of questions and the understanding of respondents. Furthermore, the study population was Chinese employees working in IT industry, thus generalizability of the current results may therefore be more appropriate within China or IT industries in Asian economies such as the Japan and the Singapore, whereas it should be cautious to generate findings to other occupations and countries outside the Asian contexts.

6.3 Implications

Overtime has become a prevalent phenomenon in the current age. Individuals and organizations have been challenged to find ways to effectively deal with time pressure and related demands. Organizations, however, it is often difficult to decrease the level of time pressure itself. Therefore, researchers and practitioners have particularly striven to identify resources that help moderate the detrimental influences of overtime on employees. This research has set out to probe the evidence that potential psychosocial characteristics might reduce negative influences of overtime on overtime employees' mental health, fatigue, WFC and job-related outcomes. Previous research suggested that the relationships between overtime and these outcomes were not simply moderated by associated psychosocial characteristics (Ota et al., 2005).

This thesis deeply investigated the prevalent issue related to overtime in the Chinese IT industry. According to a People'sDaily (2016) report, a powerful Chinese magazine, IT industry has become the most serious overtime industry in China. As previously described, China is a collectivist culture context, in which personal traits which can assist collective unified goals are valued, such as individual sacrifice for the group goal achievement and contributions towards maintaining harmonious inter-group relationships and perceive employer or manager as a power of authority. In this research, conformity was identified a factor affecting involuntary overtime such as employees worked overtime to help their colleagues to complete group tasks or they worked overtime because their manager was still in the office. These findings suggest that organizations should take the cultural context into account when making policies to improve overtime working conditions.

Qualitatively this research identified the significant function of reward and worktime autonomy in overtime employees' experiences of emotional exhaustion, work interference with family and job-related results related to overtime work in the work place; it also found employees who engaged in

voluntary overtime reported fewer negative emotions than employees who were forced to work overtime apparently or invisibly. Quantitatively the research further confirmed the moderating effect of these moderators. Given this, this research may have some theoretical implications for occupational psychology.

Previous studies investigating overtime have focused on assessing the influence of overtime on mental health (e.g. depression, stress), WFC, and job-related outcomes (e.g. job satisfaction, turnover intention) (Grzywacz & Marks, 2000; Kleppa et al., 2008; Michie & Williams, 2003; Sato, Miyake, & Thériault, 2009). Furthermore, present studies have started to explore the potential intervention factors mitigating the negative influences of overtime, including rewards (Van Der Hulst & Geurts, 2001) and worktime autonomy (Geurts et al., 2009). Regarding rewards, compensation for overtime and rewards for effort are investigated in respective studies in relation to the overtime effects. It would be reasonable to compare the function of compensation for overtime and rewards for effort at work in a research as a finding from study one was that even though overtime employees received compensation for overtime (e.g. money and time compensation), they still reported negative responses towards overtime (e.g. anxiety and low job satisfaction) as the compensation was not satisfying. Therefore, effort-reward balance can be considered as another angle to assess the effect of rewards on overtime influences.

In addition, the effect of worktime control on reducing overtime's adverse influences has been focused on a global level (Ala-Mursula et al., 2002; Ala-Mursula et al., 2004; Butler et al., 2009; Grzywacz et al., 2007; Hughes & Parkes, 2007; Valcour, 2007), whereas effects of sub-dimensions of WTC still lack investigation. Therefore, this present research focused on control over time-off and control over daily hours. Future research can further investigate each sub-dimension of WTC in relation to its respective effect on overtime's outcomes.

Moreover, important findings of current research on voluntary & involuntary overtime offer initial evidence of its associations with mental health issues related to overtime, work-related outcomes, and job resources (reward and worktime flexibility), and further extend the utility of Watanabe and Yamauchi (2016)'s measures of voluntary and involuntary overtime. The next stage of the research is to proceed onto investigating the voluntary & involuntary overtime determinants and developing a valid and reliable measurement. Furthermore, it needs more research to demonstrate whether facilitating voluntary overtime decreases adverse influences and investigate how culture context affects employees' behaviour engaged in overtime; for instance, how employer or manager constraints the employee's overtime decision.

The moderation models and mediation models found in this research needs further investigation. As far as the author's current knowledge, this is the first study to investigate the moderating effect of WTC on the relationships between overtime hours and mental health, WFC, and job satisfaction, and the moderating effect of voluntary overtime on the relationships between overtime hours and mental health, fatigue, WFC, job satisfaction and work engagement. The moderation findings may indicate that the influence of overtime hours on mental health, WFC and job-related outcomes depends on how much worktime autonomy is available at work and to which extent the employee undertakes the overtime work voluntarily. However, this suggestion is still tentative and further research is needed to demonstrate these findings including mental health, WFC and job-related outcomes respectively.

The mediation models found in this research have further sought to identify and explain the mechanism or process that underlines an observed relationship between WTC and mental health, WFC and job-related outcomes via the mediating variable, voluntary overtime and the relationship between ERI and mental health, WFC and job-related outcomes via the mediating variable, involuntary overtime. Results from study one suggested that WTC

may contribute to voluntary overtime and ERI may induce involuntary overtime, which may result in distinct impacts. Study two further explored and identified the process or mechanism. The conceptual model about voluntary and involuntary overtime put forward in this research is a new finding and a major contribution to the theory and future research in this area.

Additionally, in terms of the relationship between overtime and mental health, the findings are still not consistent and therefore further research is needed to provide powerful evidence. The relationships proposed by our hypotheses require further testing by longitudinal studies to erect causal relationships about the influence of rewards, WTC and voluntary overtime on employees' mental health, WFC and job-related outcomes related to overtime.

In addition, this research may have practical implications for organizational overtime regulations or policy and practices in the workplace. In order to improve overtime employees' mental health, work-family balance and productive job-related outcomes, providing appropriate rewards is inevitable and imperative. In order to provide an efficient reward designed to compensate overtime employees, the organization also needs to consider the actual reward is in accordance with individual person's preference and desire, and therefore the organization should tailor reward system based on the investigation of overtime employees' reward expectation (e.g. money, time compensation or learning opportunity). This research indicates that Managers should try to make the basis of reward distribution decisions in a dignified, respectful and caring manner to enable the employees to feel justice (Winefield, Saebel, & Winefield, 2010). Organizations may benefit from focusing on ways to improve motivation mechanisms in addition to pursue the likely option of reducing overtime hours.

Furthermore, this study found effort-reward balance is important for mental health, but did not find the significant function of specific reward or

compensation for overtime work which may be not consistent with previous limited findings such as Beckers et al. (2008). However, further research is needed to investigate not only whether overtime employees receive overtime compensation or not but also whether the compensation is satisfying or not, which may benefit from providing further evidence for organisations to improve their rewarding system regarding overtime compensation or overall effort-reward implication for distinct job roles or positions at work.

Furthermore, improving worktime flexibility may particularly benefit overtime employees significantly who had frequent or long overtime working hours in terms of reducing their mental health problems, WFC and increasing job satisfaction. The findings of interaction effects that control over time-off may have more benefit for female and overtime employees who have dependents taken care of, and control over daily hours may exert more benefit for female suggests that when the organization considers undertaking the practice of providing worktime autonomy job resource at work, gender and personal circumstances should be taken into account in order to maximize the function of worktime autonomy.

Besides reward and WTC interventions, facilitating employees to engage in voluntary overtime and preventing compulsory overtime working is likely another way to reduce negative outcomes caused by overtime. Even though Olds and Clarke (2010) found that the risks of adverse events still increased if nurses engaged in voluntary overtime more than 4 hours a week on average and Watanabe and Yamauchi (2016) indicated that overtime work may ultimately induce adverse impacts on nurse well-being, voluntary overtime was also recommended as another moderator likely to induce less adverse emotions and impacts than compulsory overtime. In particular, the present research indicated that influences of overtime hours on employees' mental health, fatigue, WFC, job satisfaction and work engagement depend on the level of voluntary overtime. Therefore, this research will valuably inform the organization to explore potential ways to facilitate voluntary overtime and

avoid involuntary overtime for the promotion of occupational health and performance.

This research offers guidance for continued progress in integrating qualitative and quantitative methods in research focusing on the association between overtime and personal and job-related outcomes. As far as our current knowledge, there is still few such kind of empirical study investigating overtime influences on IT employees. Most of related studies are more general, focusing on the whole group from different industries or more specifically on hospital nurses and doctors (e.g. Caruso et al., 2006; Gareis & Barnett, 2002; Kleppa et al., 2008). Despite indications that the IT industry relies heavily on overtime from employees, this industry has not been studied separately. More research is needed to confirm and generalise the findings to a larger population in this field.

To make a contribution to employees in China Mobile, results of this research were presented to the organisational manager who gave the permission to this research conducted. A summary of these results was then circulated to all members of the organisation via a newsletter in organisational *"wechat"* group. Several participants provided the feedback that the results of the research truly reflected moderating effects of rewards, WTC and voluntary overtime on the influence of overtime and they suggested the organisation put these interventions into effect, consequently improving their positive attitudes towards overtime working and reducing the negative impacts caused by overtime. In addition, the manager replied they would discuss in detail and substantively about the next steps and come to decisions.

In addition, a strand of research related to overtime has been conducted almost exclusively in an individualist cultural context. This research indicates that the Western research instruments used in this research may be also applicable in the collectivist context. The results found in this research also highlight the potential for organizational overtime policies and practices as

tools in the promotion of mental health, work-family balance and job performance in the collectivist cultural context.

6.4 Conclusion

This thesis presents an exploration of overtime employees' experiences of overtime and predominant influences induced by overtime among Chinese overtime employees based in in a Chinese mobile communication company and identifies potential psychosocial characteristics for mitigating the negative impacts related to overtime. The qualitative study performed with overtime employees explored their feelings during or after overtime work, the impacts of overtime on their life and their opinions towards rewards for overtime compensation. Based on the qualitative findings, further quantitative study investigated the effects of potential moderators (reward, WTC and voluntary and involuntary overtime) on the outcome variables (including mental health, WFC and job-related outcomes); it also investigated the moderating effect of these moderators on the relationships between overtime and outcome variables. Effort-reward balance plays a great role in overtime employees' mental health (including depression, anxiety, stress, fatigue and sleep problem); WFC and job-related outcomes (including job satisfaction, turnover intention and work engagement); control over time-off and control over daily hours make a significant difference in mental health, WFC and job satisfaction, whereas in terms of acute fatigue and intershift recovery, it appears to be affected significantly merely by control over time-off; involuntary overtime is correlated with negative outcomes whereas voluntary overtime seems to bring less adverse outcomes; additionally, regarding overtime employees who engage in higher voluntary overtime, they are more likely experiencing less mental health problems, WFC and higher job satisfaction and work engagement. Further research with IT employees is recommended to investigate the effect of WTC (including control over time-off and control over daily hours) on overtime employees' mental health as well as explore factors contributed to both voluntary overtime and

involuntary overtime and what differences they are likely to make on employees' mental health and job-related outcomes. Further research is also needed to explore the process or mechanism in WTC – mental health, job satisfaction and work engagement relationships via voluntary overtime as well as in ERI – mental health, WFC and job satisfaction via involuntary overtime.

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Appendixes

Appendix A Materials

This section displays the materials used in this research. In practice, Chinese version was applied as the research was based on the Chinese context.

A.1 Ethical Approval Letter



The University of Nottingham

UNITED KINGDOM · CHINA · MALAYSIA

Faculty of Medicine & Health Sciences
School of Medicine
Division of Psychiatry and Applied Psychology
The University of Nottingham
YANG Fujia Building
Jubilee Campus
Nottingham
NG8 1BB
t: +44 (0)115 82 32214
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Investigator: Jiaoyang Yu

Title of study: Worktime control and rewards as moderators between overtime and mental health, work-family conflict, job satisfaction and turnover intention in China's IT industry

Duration of study: Until October 2018

Ethics reference number: 201

27th June 2016

A favourable opinion is given to the above named study on the understanding that the applicants conduct their research as described in the above numbered application, and adhere to all conditions under which the ethical approval has been granted

David Daley (Professor)

Co-Chair of DPAP Ethics Subcommittee

Amanda Griffiths (Professor)

Co-Chair of DPAP Ethics Subcommittee

A.2 Invitation Email to Organization

From: Jiaoyang Yu [msxjy1@nottingham.ac.uk]

To: Manager: [fanjian@sx.chinamobile.com]

Tuesday, 29th March, 2016 1:10 PM (UK time)

Dear Manager:

I am a PhD student studying Applied Psychology in the School of Medicine, University of Nottingham. As part of my course, I am undertaking a research project: "worktime control and rewards as moderators between overtime and psychological health, work-family conflict, job satisfaction"

Prior to undertaking the study, I need your agreement/consent to approach the employees within your organisation to take part in the study. I hope to recruit 15 participants for interview and 300 participants for questionnaire. This research will only take a little spare time of participants. The interview will need approximately 15 minutes and will be carried out when participants are convenient. Questionnaires may take approximately 10 minutes and participants only need to open a link to complete it.

I can assure you that I will make every effort to ensure the study does not disrupt the working environment in any way. This research is only for academic purpose and any data collected will remain confidential. I am applying ethical approval for the study from the University of Nottingham, Faculty of Medicine & Health Sciences Research Ethics Committee.

If you have any queries or concerns, please feel free to contact me. Thanks for your permission and support in advance.

Sincerely,

Jiaoyang Yu
PhD student
Division of Psychiatry and Applied Psychology
School of Medicine
University of Nottingham
Tel: 008615135108557
Email: msxjy1@nottingham.ac.uk

A.3 Permission from the Organization

From: Manager: Jian Fan [fanjian@sx.chinamobile.com]
To: Jiaoyang Yu [msxjy1@nottingham.ac.uk]

Thursday, March 31, 2016 3:53 PM (UK time)

Dear Jiaoyang Yu,

In response to your inviting letter, now I give you the permission to approach our employees to invite them to participate in your research.

What needs to be noted is that, the interview should be carried out during the break of the workday or other time, but not during working time.

Hope this helps with your research.

Warmest Regards,

Jian Fan

China Mobile Communications Group Shanxi Co. LTD.

Address: No. 59th, Bin Gong Nan Road, North Street, Taiyuan City, Shanxi Province

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13453417879@139.com



A.4 Interview Invitation Email

To whom it may concern:

Dear Sir/ Madam,

With reference with the above captioned, please be informed that I am a PhD student in the School of Medicine, the University of Nottingham and presently doing a research: “worktime control and rewards as moderators between overtime and psychological health, work-family conflict, job satisfaction in China” under the supervision of Dr Fiona Gavin and Professor Stavroula Leka.

My intention is to conduct in-depth interviews lasting approximately 15 minutes to a number of male and female full-time employees who work overtime in the previous six months, which aims to explore firstly, the predominant predicators of psychological health problems related to overtime; secondly, employees’ satisfaction degree on present rewards for overtime and other preferred compensation; thirdly, employees’ overall opinion towards overtime.

It is probable that the findings of this research will be published and some quotations will be used, but all your response will be strict anonymous to definitely make sure your identity will be identified. Additionally, all information will be stored confidentially and it will be only used for academic intention. The purpose of this letter is to invite you to participate in this research. Your kind assistance will provide new insights in the study of overtime and promote the organizational system on employees' worktime control and rewards for overtime.

I would be pleased to arrange the interview at any time via skype or other instruments online to suit your convenience. It would be very appreciating and grateful if you could forward your response to the following phone number or e-mail:

008615135108557
yujiaoyang@hotmail.com

Thank you very much in anticipation for your assistance and co-operation.

Sincerely,

Jiaoyang Yu
PhD student
Division of Psychiatry and Applied Psychology
School of Medicine
University of Nottingham

A.5 Questionnaire Survey Invitation Email

Dear Sir/ Madam,

Please be informed that I am a PhD student in the School of Medicine, the University of Nottingham and presently doing a research: "worktime control and rewards as moderators between overtime and psychological health, work-family conflict, job satisfaction in China" under the supervision of Dr Fiona Gavin and Professor Stavroula Leka and this research has achieved ethical approval letter from the school's Ethics Committee. The primary purpose of this research is to:

Explore to what extent worktime control can moderate the adverse influence of overtime on employees' psychological health, work-life balance as well as job satisfaction and turnover intention.
Investigate to what extent rewards for overtime can compensate overtime's negative effect on employees' psychological health, work-life balance as well as job satisfaction and turnover intention.
Explore the interacting effect of worktime control and rewards for overtime on the above variables.

The findings will be used to:
Provide guidance on increasing autonomy of worktime, such as flextime, break control, leave control and overtime control
Provide guidance on how to reward employees' overtime investment to obtain the maximum value.

Your rights
All data will be collected anonymously. No information used in the report or probable publishment could identify the individual.

All data will be confidential; data will be processed and stored in accordance with the Data Protection Act.
Should you wish, you may cease to complete the survey at any point.

To do this research, we need your kind assistance and co-operation. It will take approximately 15 minutes to answer the questionnaire. Please click the following link to start https://www.wjx.cn/jq/9733365.aspx. This research is only for academic use. Thank you in anticipation for your kind participation and assistance. If you have any queries, please do not hesitate to contact:

Researcher: Jiaoyang Yu, PhD student, Division of Applied Psychology, School of Medicine, University of Nottingham.
Phone: 008615135108557
Email address: msxjy1@nottingham.ac.uk

A.6 Participant Information

Phase 1

PARTICIPANT INFORMATION

Division of Psychiatry & Applied Psychology

School of Medicine, Faculty of Medicine & Health Sciences

Project Title: Worktime control and rewards as moderators between overtime and mental health, work-family conflict, job satisfaction and turnover intention in China's IT industry

Researcher: [Name] Jiaoyang Yu [e-mail] msxjy1@nottingham.ac.uk

Supervisor: [Name] Fiona Gavin [e-mail] Fiona.Gavin@nottingham.ac.uk

Ethics Approval Reference Number: … *[to be inserted following ethical review]*

This is an invitation to take part in a research study investigating whether employees provided with high worktime control and rewards have higher mental health and job satisfaction as well as lower work-family conflict and turnover intention than those with low worktime control and rewards. This information is designed to tell you what it will involve.

Your participation is voluntary, and you may change your mind about being involved, or decline to answer a particular question or stop the recording at any time, and without giving a reason. You are free to withdraw at any point before or during the interview. You can also withdraw your data within one week after the interview. However, once the audio recording finished transcribing and the data analysis has begun, the data cannot be withdrawn.

What is the project about?

The aim of this research is to investigate whether employees who have high autonomy over worktime (e.g. starting and ending times of the workday, the scheduling of vacations and paid days off) and high rewards, have significantly higher mental health and job satisfaction as well as lower work-family conflict and turnover intention than those with low worktime autonomy and rewards.

Who is being asked to take part, and why?

You are being invited to take part because you are a full-time worker who works in the China's IT industry and may be involved with overtime in your work. We are inviting 15 participants for interviews and 300 participants for questionnaire survey in your company.

What will I be asked to do?

You are invited to do an interview to talk about your experience and opinion on overtime, which will take approximately 15 minutes. The interview will be audio recorded but not matched with your name. Your participation is totally voluntary. The interviews are anonymous. Anyone who does not want to take part will not be identified and there is no impact on you.

Will the research be of any personal benefit to me?

There are not likely to be any direct personal benefits from taking part in this study. However, you will be helping to promote a greater understanding of overtime and the way it affects workers in the IT industry. This research may provide the evidence to inform policy establishment and implementation on overtime which in turn may have a positive impact on workers experience of overtime.

What will happen to the information I provide?

The information you provide will be assured with high confidentiality and stored in a safe place. It will only be accessed to by the researcher and supervisor from the University of Nottingham who organize the research. They may also be accessed to by authorized people to check the research is being conducted appropriately. You will be definitely unidentified in any outcomes in any way.

Your interview will be audio recorded. Your personal details will be removed when the recordings are transcribed by the researcher to ensure anonymity. We would like to be able to quote what you say in our report or a publication. We will make sure that your anonymity is protected. But if you do not wish us to do so, please tell us.

What will you do with the data?

The results of this research will be written up as part of an educational qualification recognised by the University of Nottingham and may be published. A general (not individual)

report will be sent to your organization if requested. Please be assured that any personal information will not be identified in any report or publication.

If you have any questions or concerns, please don't hesitate to ask. We can be contacted before and after your participation at the above address.

THANK YOU FOR YOUR PARTICIPATION

If you have any queries or complaints about this study, please contact the student's supervisor in the first instance. If this does not resolve the query to your satisfaction, please write to the Administrator to the Division of Psychiatry & Applied Psychology's Research Ethics Committee (MS-DPAPEthics@nottingham.ac.uk, +44 (0)115 8232214) who will pass your query to the Chair of the Committee

We believe there are no known risks associated with this research study; however, as with any online related activity the risk of a breach is always possible. We will do everything possible to ensure your answers in this study will remain anonymous. We will minimize any risks by promising data confidentiality that only the researcher, supervisor or authorised people by the University have the right to access to it; the data will be stored in the researcher's private computer safely; the raw data will be destroyed after translating the recordings into transcripts

Phase 2

PARTICIPANT INFORMATION

Division of Psychiatry & Applied Psychology

School of Medicine, Faculty of Medicine & Health Sciences

Project Title: Worktime control and rewards as moderators between overtime and mental health, work-family conflict, job satisfaction and turnover intention in China's IT industry

Researcher: [Name] Jiaoyang Yu [e-mail] msxjy1@nottingham.ac.uk

Supervisor: [Name] Fiona Gavin [e-mail] Fiona.Gavin@nottingham.ac.uk

Ethics Approval Reference Number: … *[to be inserted following ethical review]*

This is an invitation to take part in a research study investigating whether employees provided with high worktime control and rewards have higher mental health and job satisfaction as well as lower work-family conflict and turnover intention than those with low worktime control and rewards. This information is designed to tell you what it will involve.

Your participation is voluntary, and you may change your mind about being involved, or decline to answer a particular question without giving a reason. You are free to withdraw at any point before or during the study. For anonymous questionnaires, once you have finished the questionnaire and submitted your answers it is not possible to withdraw the data.

What is the project about?

The aim of this research is to investigate whether employees who have high autonomy over worktime (e.g. starting and ending times of the workday, the scheduling of vacations and paid days off) and high rewards, have significantly higher mental health and job satisfaction as well as lower work-family conflict and turnover intention than those with low worktime autonomy and rewards.

Who is being asked to take part, and why?

You are being invited to take part because you are a full-time worker who works in the China's IT industry and may be involved with overtime in your work. We are inviting 15 participants for interviews and 300 participants for questionnaire survey in your company.

What will I be asked to do?

You are invited to do an online questionnaire survey, which will take approximately 10 minutes. Your participation is totally voluntary. The questionnaires are anonymous. Anyone who does not want to take part will not be identified and there is no impact on you.

Will the research be of any personal benefit to me?

There are not likely to be any direct personal benefits from taking part in this study. However, you will be helping to promote a greater understanding of overtime and the way it affects workers in the IT industry. This research may provide the evidence to inform policy establishment and implementation on overtime which in turn may have a positive impact on workers experience of overtime.

What will happen to the information I provide?

The information you provide will be assured with high confidentiality and stored in a safe place. It will only be accessed to by the researcher and supervisor from the University of Nottingham who organize the research. They may also be accessed to by authorized people to check the research is being conducted appropriately. You will be definitely unidentified in any outcomes in any way.

What will you do with the data?

The results of this research will be written up as part of an educational qualification recognised by the University of Nottingham and may be published. A general (not individual) report will be sent to your organization if requested. Please be assured that any personal information will not be identified in any report or publication.

If you have any questions or concerns, please don't hesitate to ask. We can be contacted before and after your participation at the above address.

THANK YOU FOR YOUR PARTICIPATION

If you have any queries or complaints about this study, please contact the student's supervisor in the first instance. If this does not resolve the query to your satisfaction, please write to the Administrator to the Division of Psychiatry & Applied Psychology's Research Ethics Committee (MS-DPAPEthics@nottingham.ac.uk, +44 (0)115 8232214) who will pass your query to the Chair of the Committee

We believe there are no known risks associated with this research study; however, as with any online related activity the risk of a breach is always possible. We will do everything possible to ensure your answers in this study will remain anonymous. We will minimize any risks by promising data confidentiality that only the researcher, supervisor or authorised people by the University have the right to access to it; the data will be stored in the researcher's private computer safely; the raw data will be destroyed after translating the recordings into transcripts.

A.7 Participant Consent

Phase 1

PARTICIPANT CONSENT

Division of Psychiatry & Applied Psychology

School of Medicine, Faculty of Medicine & Health Sciences

Project Title: Worktime control and rewards as moderators between overtime and mental health, work-family conflict, job satisfaction in China's IT industry

Researcher: [Name] Jiaoyang Yu [university e-mail] msxjy1@nottingham.ac.uk

Supervisor: [Name] Fiona Gavin [university e-mail] Fiona.Gavin@nottingham.ac.uk

Ethics Approval Reference Number: …. *[to be inserted following ethical review]*

- Have you read and understood the Participant Information? YES/NO

- I agree to take part in an interview that will be recorded. YES/NO

- Do you know how to contact the researcher if you have questions about this study? YES/NO

- Do you understand that you are free to withdraw from the study without giving a reason? YES/NO

- Do you understand that once you have been interviewed it may not be technically possible to withdraw your data unless requested within one week after the interview and once data analysis begins, the data cannot be withdrawn?

YES/NO

- D o you give permission for your data from this study to be shared with other researchers in the future provided that your anonymity is protected?
  YES/NO

- D o you understand that non-identifiable data from this study might be used in academic research reports or publications?

YES/NO

Signature of the Participant …… Date: …….

Name (in block capitals) ……

Phase 2

PARTICIPANT CONSENT

Division of Psychiatry & Applied Psychology

School of Medicine, Faculty of Medicine & Health Sciences

Project Title: Worktime control and rewards as moderators between overtime and mental health, work-family conflict, job satisfaction in China's IT industry

Researcher: [Name] Jiaoyang Yu [university e-mail] msxjy1@nottingham.ac.uk

Supervisor: [Name] Fiona Gavin [university e-mail] Fiona.Gavin@nottingham.ac.uk

Ethics Approval Reference Number: …. *[to be inserted following ethical review]*

- Have you read and understood the Participant Information? YES/NO

- I agree to answer a questionnaire. YES/NO

- Do you know how to contact the researcher if you have questions about this study? YES/NO

- Do you understand that you are free to withdraw from the study without giving a reason? YES/NO

- Do you understand that for anonymous questionnaire studies, once you have completed the study and submitted your questionnaire, the data cannot be withdrawn?
  YES/NO

- D o you give permission for your data from this study to be shared with other researchers in the future provided that your anonymity is protected?
  YES/NO

- D o you understand that non-identifiable data from this study might be used in academic research reports or publications?

YES/NO

Signature of the Participant …… Date: …….

Name (in block capitals) ……

By clicking the button above/below I indicate that I understand what the study involves and that my answers are anonymous. I agree to take part and I understand that once I click 'submit' at the end of the questionnaire it will not be possible to withdraw the data.

A.8 Interview Guides

1. Can you tell me something about the overtime in your current job?
2. Can you talk about how do you feel during or after overtime work?
3. Can you tell me something about the effect of overtime work on your life?
4. Can you talk about your opinion on overtime rewards or compensation?

(Prompts: a. Is your overtime work compensated by extra rewards?

b. Are you satisfied with the rewards?

c. Do you think your effort and reward is balanced?

d. What compensation would you like better for overtime work?)

5. What do you think about the overtime work overall?

6. Is there anything else you would like to add about overtime or related issues?

A.9 Interview Transcript

One example of interview transcripts in English version was attached.

1. Gender： female

2. Age：34

3. Marital status ： married

4. Do you have dependents (e.g. children or parents) been taken care of now? No

5. Your highest educational level：Master

6. Your income (RMB/month) 20000 (if you don't mind answering)

7. Have you worked overtime in the previous six months? Yes

8. In the previous six months, how many hours per week you spent on paid and unpaid overtime work? (including overtime hours at home, excluding commuting time) from September to December 15 hours, from January to August 10 hour

I.	**Can you tell me something about the overtime in your current job?**
P.	No person would like to work overtime unconditionally. But now our work is task-oriented or event driven. When it comes to the time node, there are some temporary tasks. Such short notice you, then you have no ways and the overtime intensity is great, you may work until 12 o'clock or late at night. But it rarely happens. And we mostly work overtime for weeks at the time

	node of the project, such as mid-term inspection or acceptance. Most overtime is event-driven and there are a few, for example, it showed a busy state. The manager usually likes to see you are busy, so some people work overtime just to put a look, whereas that is generally not too long and just leave two hours later ah.
I.	**You mentioned short notice, and can you talk about it?**
P.	It depends on the nature of work. For us, there are some temporary tasks, actually more. In particular, for example, the manager arranges you a task, and then some are temporary, such as a report for tomorrow, an inspection for tomorrow. And a task is being modified over and over. For example, you had amended the report seven or eight times, and when you showed it to the manager, he was not satisfied and let you have to change it out tomorrow or the day after tomorrow. This situation exists. There are about one third of temporary tasks. In my overtime work, one third of overtime is temporary and two thirds is because of the time node or too much work. No one is particularly happy to work overtime. If overtime work is for a clear goal or has a specific time node, I feel my mental state is still possible; that is not the kind of bored. But sometimes a long-term overtime or you work overtime is just for a pose also exist. When we are at the end of the year, no matter whether you are busy or not, you have to work six days a week and leave after 9 pm. When there are such requirements, you will feel bored or a sense of resistance mood will come up. That belongs to the regulation which requires you to work overtime mandatorily.
I.	**Can you talk about how you feel during or after overtime work?**
P.	Occasional overtime, when you finish, sometimes you feel a sense of achievement. I made a concentrated effort on a task and suddenly I found my potential outbreak, which you should have finished it in two weeks, but you complete it using one or two days. If it is the long-term overtime, you certainly will feel, oh, so tired ah. You were in a continuous overtime and you were always wishing it finish quickly. I have to relax. For example, I go to a shopping; I must go to a day play; I have to sleep one day. That's I need

	relax. It is common to have a mind, looking forward to finishing quickly and then relaxing. And then during overtime, it is not saying that every day is very efficient, and it depends on the circumstances. If there was a heavy task recently or a frequent overtime, when you came home, your brain was in a state of exhaustion as well as excitement. The pressure is relatively high, which will definitely affect your sleep. Particularly, if you have a meeting in the next morning or a thing to deal with, which you feel difficult, you will suffer from insomnia. I will and my colleagues will. I feel it is more obvious among women than men.
I.	**Can you tell me something about the effect of overtime work on your life?**
P.	It takes up your time of life or changes something you arranged in advance, such as eating out ah, or watching a movie, or excising, which definitely will be affected. Especially for the temporary overtime, the impact is sudden and will disrupt your plans established. But the long-term overtime which you have already planned for, is okay. But the period of long-term overtime should not be too long. For example, I was bored if the workload was heavy and I kept working overtime for a long time.
I.	**Any other impacts?**
P.	If I have a baby later, and for families with children, there's certainly no time to accompany the child. It is common for us to work overtime. My husband and I are in the same organization, so it's okay. We rarely complain each other because of overtime which takes up the life time. We usually discuss together to spare some time every week to do something we want. If one works overtime frequently and the other is relatively free, it will be more controversial. I think we are fine and there's basically no bad family emotion because of overtime. In this era of rapid development, the work task is too heavy. It is not possible to finish all the tasks reasonably without overtime, so that you have to work overtime. It is just to say whether the overtime is controlled reasonably or scheduled effectively by yourself or it is always temporary or repeated fruitless overtime work. I think this makes big difference. I will have a bored mood if it is always the temporary task or you

	need to work overtime tomorrow and tomorrow. I feel okay if the overtime is appropriate, reasonable and that I can arrange. But I always receive the temporary task and the adjustment of the work, which inevitably makes me work overtime. It is common. I think the impact between the structured overtime and temporary overtime is different.
I.	**Can you talk about your opinion on overtime rewards or compensation?**
P.	We don't have a specific compensation for overtime, such as a taxi fee after 9 o'clock, the overtime fees calculated by the hour. There's no exactly overtime statistics, which are generally count by the organization. It is also frequent for the manager to work overtime. If you work overtime and get a good performance, there's a unified response on your salary per month or at the end of the year. But the salary is not completely proportional to overtime hours. It mainly depends on the impression you leave to the manager. If your work intensity and workload is high, the related compensation and bonus will be relatively more. But I think it is not completely proportional with overtime. Our salary is basic salary plus performance bonus. The basic salary is based on your job position and level. The performance is based on the amount of the task you completed, the importance of the task and the amount of funding for the task. The more funding for the task, the more you receive at the end of the task. The overtime is necessary. Previously, a person's performance is superficially measured by the overtime hours. But the manager's mind has progressed now. Before the manager wanted you to keep sitting there to work overtime. For example, when finishing your work, you learn two hours late before you leave. This is a key change. It is not for overtime to work overtime.
I.	**What compensation would you like better for overtime work?**
P.	Of course, the most direct compensation is money. Hope it's related to the money. And you can exchange for vacation according to your overtime hours. For example, when your overtime hours reach a certain limit, you can get a half-day or one day time compensation. Our manager once mentioned if you worked overtime frequently, for an overtime period, you can get one

	day or two days leave. But this is unrealistic unless it is stipulated in explicit terms. It cannot be implemented and is unrealistic if it is just the manager's verbal promise. It will be good that the dinner is provided on the overtime day. With regard to the promotion, it is not necessarily linked to overtime. The verbal reward from the manager is also needed. For example, the manger comforts you when you work overtime for a long time. But this refers to the senior leader and there's not much effect of the department manager met every day. The top leader visits you every now and then and gives you spiritual encouragement, whereas it is helpful occasionally, but there's no substantive significance.
I.	**What do you think about the overtime work overall?**
P.	It is feasible for moderate overtime and indeed it reflects your performance and the position's importance. An able person is always busy. If you are a more efficient person, or a relatively capable person and you can do the project that others cannot do or break, you will receive the temporary missions, which is usually assigned to the busy people. Work is not equally distributed. Some people are very free, and some people are very busy. So, overtime hours and status are related to your ability and importance. But we certainly want reasonable and moderate overtime which can be controlled and planed by ourselves, and don't like to do some sudden and pointless overtime work.
I.	**Is there anything else you would like to add about overtime or related issues?**
P.	Now the pace of work is fast, especially in big cities. We are all talking about overtime. This may probably because there's no good plan for the job. And china is still a rapidly developing country, so that overtime is a necessity. Therefore, the first thing is rationality and the second is the compensation availability.

A.10 Questionnaires

The following questions will be asked. However, more may be added following analysis of data from the interviews (phase 1).

For the purpose of statistical analysis only, your answers will be anonymous and confidential. Please tick the most appropriate answer in the following questions.

Individual Characteristics

1. Sex A. Male B. Female

2. Age _____

3. Martial status _____ (if you don't mind answering)

A. Single B. Cohabiting C. Married D. Divorced E. Widowed

4. Do you have dependents (e.g. children or parents) been taken care of now?

A. Yes B. No

5. Your highest educational level

A. Middle School B. High School C. Bachelor D. Master E. Doctor

6. Your income (RMB/month) _____ (if you don't mind answering)

Overtime Information (Beckers et al., 2008)

1. Have you worked overtime in the previous 6 months?

A. Yes B. No

2. On average, how many hours per week do you spend on paid and unpaid overtime work in the previous six months? (including overtime work executed at home, but NOT including your commuting time) _____

3. On average, how many days per month do you work overtime?

4. To what extent can you schedule your overtime in advance?

1. All the time 2. Most time 3. Sometimes 4. Rarely 5. Never

Mental Health (DASS-21)

Participants respond to each item by rating the frequency and severity of experiencing symptoms over the previous week using 4-point Likert scale (0

did not apply to me at all to 3 applied to me very much or most of the time)

1. I found it hard to wind down
2. I was aware of dryness of my mouth
3. I couldn't seem to experience any positive feeling at all
4. I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)
5. I found it difficult to work up the initiative to do things
6. I tended to over-react to situations
7. I experienced trembling (e.g., in the hands)
8. I felt that I was using a lot of nervous energy
9. I was worried about situations in which I might panic and make a fool of myself
10. I felt that I had nothing to look forward to
11. I found myself getting agitated
12. I found it difficult to relax
13. I felt down-hearted and blue
14. I was intolerant of anything that kept me from getting on with what I was doing
15. I felt I was close to panic
16. I was unable to become enthusiastic about anything
17. I felt I wasn't worth much as a person
18. I felt that I was rather touchy
19. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)
20. I felt scared without any good reason
21. I felt that life was meaningless

Occupational Fatigue Exhaustion Recovery (OFER 15) Scale (Winwood, 2005)

0 to 6 – “Strongly Disagree” to “Strongly Agree” – which best indicates your response.

1. I often feel I’m ‘at the end of my rope’ with my work.
2. I often dread waking up to another day of my work.

3. I often wonder how long I can keep going at my work.

4. I feel that most of the time I'm just "living to work".

5. Too much is expected of me in my work.

6. After a typical work period I have little energy left.

7. I usually feel exhausted when I get home from work.

8. My work drains my energy completely every day.

9. I usually have lots of energy to give to my family or friends.

10. I usually have plenty of energy left for my hobbies and other activities after I finish work.

11. I never have enough time between work shifts to recover my energy completely.

12. Even if I'm tired from one shift, I'm usually refreshed by the start of the next shift.

13. I rarely recover my strength fully between work shifts.

14. Recovering from work fatigue between work shifts isn't a problem for me.

15. I'm often still feeling fatigued from one shift by the time I start the next one.

Work-family Conflict (Carlson et al., 2000)

5-point response rate: 1 (Strongly disagree) to 5 (Strongly agree)

Time-based work interference with family

1. My work keeps me from my family activities more than I would like.

2. The time I must devote to my job keeps me from participating equally in household responsibilities and activities.

3. I have to miss family activities due to the amount of time I must spend on work responsibilities.

Strain-based work interference with family

4. When I get home from work I am often too frazzled to participate in family activities/responsibilities.

5. I am often so emotionally drained when I get home from work that it prevents me from contributing to my family.

6. Due to all the pressures at work, sometimes when I come home I am too

stressed to do the things I enjoy.

Behavior-based work interference with family

7. The problem-solving behaviors I use in my job are not effective in resolving problems at home.

8. Behavior that is effective and necessary for me at work would be counterproductive at home.

9. The behaviors I perform that make me effective at work do not help me to be a better parent and spouse.

Job Satisfaction (Brayfield and Rothe, 1951)

5-point response rate: 1 (Strongly disagree) to 5 (Strongly agree)

1. I feel fairly satisfied with my present job

2. Most days I am enthusiastic about my work

3. Each day of work seems like it will never end

4. I find real enjoyment in my work

5. I consider my job rather unpleasant

Turnover intention (Richter, 1999)

Since you joined the company, has there ever been a time when you seriously thought about quitting?

Three response options: a. yes, and nothing has improved; b. yes, but no longer; c. no.

Work Engagement (UWES-9) (Schaufeli & Bakker, 2003)

The following 9 statements are about how you feel at work. Please read each statement carefully and decide if you ever feel this way about your job. If you have never had this feeling, cross the '0' (zero) in the space after the statement. If you have had this feeling, indicate how often you feel it by crossing the number (from 1 to 6) that best describes how frequently you feel that way.

0 Never, 1 almost never (a few times a year or less), 2 rarely (once a month or less), 3 sometimes (a few times a month), 4 often (once a week), 5 very often

(a few times a week), 6 always (every day)

1. At my work, I feel bursting with energy (VI1)
2. At my job, I feel strong and vigorous (VI2)
3. I get carried away when I'm working (DE1)
4. My job inspires me (DE2)
5. When I get up in the morning, I feel like going to work (VI3)
6. I feel happy when I am working intensely (AB1)
7. I am proud on the work that I do (DE3)
8. I am immersed in my work (AB2)
9. I get carried away when I'm working (AB3)

VI=vigor; DE=dedication; AB=absorption

Worktime Control (WTC) (Ala-Mursula et al., 2002)

5-point response rate: 1 (very little) to 5 (very much)

The respondents were asked to rate how much they were able to influence the following aspects of their working times:

(1) the length of a work day
(2) the starting and ending times of a workday
(3) the scheduling of work shifts
(4) the taking of breaks during the workday
(5) handling private matters during the workday
(6) the scheduling of vacations and paid days off
(7) the taking of unpaid leave

Effort-reward imbalance (ERI) (Siegrist et al. 2004)

From 1 (strongly disagree) to 4 (strongly agree)

1. I have constant time pressure due to a heavy workload.
2. I have many interruptions and disturbances while performing my job.
3. I have a lot of responsibility in my job.
4. I am often pressured to work overtime.
5. My job is physically demanding.
6. Over the past few years, my job has become more and more demanding.

7. I receive the respect I deserve from my superior.

8. I receive the respect I deserve from a respective relevant person.

9. I experience adequate support in difficult situations.

10. I am treated unfairly at work.

11. My job promotion prospects are poor.

12. I have experienced or I expect to experience an undesirable change in my work situation.

13. My employment security is poor.

14. My current occupational position adequately reflects my education and training.

15. Considering all my efforts and achievements, I receive the respect and prestige I deserve at work.

16. Considering all my efforts and achievements, my job promotion prospects are adequate.

17. Considering all my efforts and achievements, my salary / income is adequate.

18. I get easily overwhelmed by time pressures at work.

19. As soon as I get up in the morning I start thinking about work problems.

20. When I get home, I can easily relax and 'switch off' work.

21. People close to me say I sacrifice too much for my job.

22. Work rarely lets me go, it is still on my mind when I go to bed.

23. If I postpone something that I was supposed to do today I'll have trouble sleeping at night.

Involuntary and voluntary overtime {self-designed from the qualitative findings and other unpublished questionnaires (Watanabe & Yamauchi, 2016)

(1 strongly disagree; 5 strongly agree)

Involuntary overtime work due to workload

Overtime work due to an inappropriate amount of work required to be completed in a given amount of time (Caplan & Jones, 1975).

1. I have to work overtime because there is so much work to be done in a limited time.

2. I have to work overtime because there are unexpected and emergent tasks.

3. I have to work overtime because there is a shortage of staff in my department.

4. I have to work overtime because some job tasks are difficult and complicated.

5. I have to work overtime because of the nature of work and workflow.

6. I have to work overtime because of some interruptions during the workday.

Involuntary overtime work due to conformity

It was defined as the overtime work generated from implicit pressures from colleagues or supervisors. (Hackman, 1992).

7. I work overtime because my manager or superior expects me to.

8. I feel uneasy about leaving even when my work is done out of regard for my colleagues.

9. I feel uneasy about leaving when my manager and superiors are still at work.

10. I feel uneasy about leaving when colleagues are still at work.

11. I have to work overtime because many of my colleagues in my office are overworked.

Voluntary overtime due to extrinsic motivation

12. I work overtime to increase my value to the company.

13. I work overtime because of the overtime pay or bonus for completion of tasks.

14. I work overtime because it is beneficial to my promotion or career development in the future.

15. I work overtime because I will learn new knowledge and skills.

Voluntary overtime due to intrinsic motivation

16. I work overtime because I like my job.

17. I sometimes find myself accidently working overtime when I am buried in my work.

18. I don’t feel pressured to work long hours.

19. I feel a sense of accomplishment after the work is done.

Appendix B Full thematic framework

Main themes	Sub-section	Descriptor	Examples (Script numbers)
1. Overtime reasons (Why do overtime?)	**Work-related Reasons**	Time node	End of month, quarter and year, timeliness of work (task time limit)
		Nature of work	High workload, job position, work flow, work content increase, work complexity, poor work schedule, understaffed
		Unexpected/ emergent work	Short notice, Emergent case, uncertainty, customer needs
		Interruption	Inspection, report, meetings, training, disturbance from other things outside work
	Personal Reasons	Capability	Personal poor arrangement, unfamiliar to work, ineffectiveness of work, work ability
		Personal qualities	Sense of responsibility for work
	Cultural influence	Expectation	The manager expects employees to learn more
		Impression management	The whole group working overtime; manger is there, it's just an act.

Main themes	Sub-section	Descriptor	Examples (Script numbers)
2. Outcomes of overtime	**Attitudes towards overtime**	Positive	Moderate overtime and could be planned in advance; Sense of accomplishment, heart comforted, excited, happy after completing task; ability of anti-stress improvement

		Negative	Dislike: compulsory overtime, overtime work without rewards, unconditional overtime; long-term and high-intensity overtime; meaningless and unproductive overtime
		Neutral	Overtime is unavoidable, inevitable and necessary. It is impossible without overtime. It is common and usual. Moderate and occasional overtime is acceptable.
	Impact on health	Mental health	Disgusted
			Reluctant, antagonistic, rejective
			Tied, fatigue
			Need a rest to recover
			Stress
			Anxious
			Tension
			Depression: dysphoria, irritable, spiritless, inactive, unhappy, miserable
			Complain
		Physical Health	Accumulated disease, sickness, get a cold, irregular sleep (bad sleep) even insomnia, cervical spondylosis, lumbar disc herniation, irregular dinner, sexual life
	Impact on Life	Family	No time to accompany families; less and unsmooth communication with families, conflicts with families; dissatisfaction, incomprehension and complaints from families; bad impact on family harmony; bring the negative emotions to families; influence families' rest
		Leisure	Lack of leisure activities, leisure time, party with friends; less rest time, relaxing time
		Planning	Temporary overtime: upset the plan, interrupt the schedule, activities, weekends Scheduled and moderate overtime: less influence
	Job-related	Job efficiency	Inefficient: extreme high workload; frequent, long term; reluctant, compulsory,

	Outcomes		negative overtime
		Work engagement	Less effort and input
		Intention to leave	Change job

Main themes	**Sub-section**	**Descriptor**	**Examples (Script numbers)**	
3. Influential Factors	**Timing of overtime**	Frequency	Occasional; frequent; long time lasting, continuous weeks' overtime	
		Intensity	Low (short time); Moderate (appropriate); High intensity: work till or after midnight, continuous weeks' overtime (temporary and emergent work & high workload during some time nodes)	
	Control	Time control	Flextime (starting and ending time of the day), later starting time after overtime; When to do overtime: some overtime work can be scheduled and planned in advance, but emergent overtime cannot be planned	
		Workload control	Autonomy: you can talk to manager; you cannot control (assigned to you)	
		Voluntary or	Sometimes voluntary and sometimes compulsory; Voluntary: overtime caused by personal reasons; can plan and schedule; positive, efficient, less fatigue, irritation; Compulsory: temporary work, high workload during time node; unavoidable; negative, reluctant, unwilling	
	Rewards	With or without Reward	Timing: Previous with, but now no; always no; always with Impact: with reward: comfort myself, positive, willing, accepted, avoid bad emotions no reward: involuntary, reluctant, avoid overtime	
		Effort-reward	Low	Reduce the enthusiasm and engagement, avoid extra effort, voluntary

		balance		overtime decreasing
			Moderate	Basically balance, relatively accepting the overtime work
			High	High workload, intensity and effort, high reward (bonus, income); voluntary overtime
		Type of reward	Financial	Time based: specific rewards to overtime Output based: rewards to performance, task completion
			Compensation	Time off; overtime dinner, taxi fee
			Managing a good impression in manager's eyes	
		Preference	Financial	Overtime money, salary, dinner fee, taxi fee
			Compensation	Holidays, rest time
			Emotional	Manager's encouragement, motivation, approval, recognition
			Development	Opportunity for learning, skills improvement; promotion
			No matter what reward, don't want to work overtime	

Main themes	**Sub-section**	**Descriptor**	**Examples (Script numbers)**
4. Solutions to Overtime Challenges	**Practical**	Personal	Improve efficiency to reduce overtime, reasonably forward planning, refuse overtime (excuse), talk with manager, balance and coordinate work and life, relax and take a rest after overtime
		Organizational	More staff, optimize work schedule, improve reward (especially for compulsory and emergent overtime)
	Emotional	Internal	Change attitudes, body-mind adjustment
		External	Social support: manager, colleagues, families