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‘Don’t run with scissors’:
An investigation into veterinary safety culture.

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Abstract

Objectives

Veterinary safety culture is traditionally associated with key elements such as checklists and the promotion of a just culture. However, there are additional factors likely to contribute to the reduction of avoidable harm to both staff and patients. This study aimed to map existing literature on safety culture and conduct a qualitative analysis to explore perceptions and practices within veterinary safety culture.

Methods

A scoping review following PRISMA-ScR guidelines was conducted across five online databases. Publications were assessed against eligibility criteria, and data were extracted from research articles, opinion pieces, case reports, and posters, categorised by subcultures/domains. The review was registered with Open Science Framework.

Additionally, a qualitative study was conducted to gather in-depth insights from UK veterinary professionals. A total of 14 semi-structured interviews with vets and Registered Veterinary Nurses and a focus group with three fourth-year veterinary students were conducted both online and in-person from January to February 2024. An inductive coding technique and thematic analysis was used to analyse the data, leading to the development of key themes.

Results

The scoping review identified 1500 publications, with 106 meeting the inclusion criteria: 58 opinion pieces, 42 research articles, 5 case reports, and 1 poster. The literature predominantly focused on checklists and the just subculture (45 and 47 articles), while teamwork (6 articles) and patient-centred approaches (3 articles) were least discussed. Publications discussing staff safety were sparse, accounting for 16 out of 106 publications.

The qualitative study revealed four themes: understanding, operational aspects, control, and risk. Participants highlighted the importance of communication, leadership, and lifelong learning in developing a positive safety culture. Additionally, issues of decision-making autonomy, and appropriate accountability were identified as significant concerns to the implementation of safety culture measures. It was further revealed that patient safety was often prioritised at the expense of personal safety, highlighting an inadequate focus on staff safety.

Conclusions

The findings from the scoping review and qualitative analysis suggest deficiencies in the comprehension and application of safety culture, particularly in relation to staff safety and patient-centred approaches. The findings underscore the need for ongoing research and the development of comprehensive, context-specific safety protocols which address the uniqueness of veterinary practice, particularly in farm and equine settings where veterinary staff face different challenges to those in small animal practice. Addressing these deficiencies is vital to mitigating avoidable harm and enhancing overall safety within veterinary practices.

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Table of contents

Abstract 2
Acknowledgements 4
Table of contents 5
List of tables 7
List of figures 8
Record of publications 9
Chapter 1: Introduction 10
1.1 Introduction to safety culture 10
1.2 What is safety culture? 10
1.21 Safety culture and organisational culture 10
1.22 Defining safety culture 13
1.23 Models of safety culture 18
1.3 What is patient safety culture? 26
1.31 Safety culture and patient safety culture 26
1.32 Veterinary safety culture 29
1.4 Aims 29
Chapter 2: Investigating veterinary safety culture - a scoping review 30
2.1 Introduction 30
2.2 Aims and objectives 30
2.3 Methods 31
2.31 Protocol and registration 31
2.32 Eligibility criteria 31
2.33 Information sources 33
2.34 Search terms 33
2.35 Selection of sources of evidence 37
2.36 Data charting process 38
2.37 Data items 38
2.38 Synthesis of results 39
2.4 Results 40
2.41 Selection of sources of evidence 40
2.42 Demographic data 41
2.43 Characteristics of sources of evidence 43
2.44 Synthesis of results 47
2.5 Discussion 52
2.51 Research protocol 52
2.52 Distribution of evidence sources 52

2.53 The evidence base for veterinary safety culture 53
2.6 Limitations 59
2.7 Conclusion and recommendations 60
Chapter 3: Veterinary safety culture - a qualitative analysis 61
3.1 Introduction 61
3.2 Aims and objectives 61
3.3 Methodology and methods 62
3.31 Research design 62
3.32 Participant selection 63
3.33 Ethical considerations 63
3.34 Data collection 64
3.35 Data analysis 65
3.4 Results 67
3.41 Interviews 67
3.42 Focus group 67
3.43 Theme development 68
3.5 Discussion 90
3.51 Study design 90
3.52 Theme 1 - understanding 90
3.52 Theme 2 - operational aspects 93
3.53 Theme 3 - control 95
3.54 Theme 4 - risk 96
3.6 Limitations 98
3.7 Conclusions and recommendations 98
Chapter 4: Conclusion 101
Appendix 1 - Record of credits gained during MRes 112
Appendix 2 - Abstract presented at BSAVA Congress 2024 113
Appendix 3 - Scoping review results extract 114
Appendix 4 - Participation information and consent form 115
Appendix 5 - Interview and focus group guide 119
Appendix 6 - Final code book 121

List of tables

Table 1 - Connections between functionalism and interpretivism (Schultz and Hatch, 1996). 12
Table 2 - Definitions of safety culture. 14
Table 3 - Inclusion and exclusion criteria. 31
Table 4 - Search terms. 33
Table 5 - The global distribution of the included literature. 42
Table 6 - The distribution of included literature by type of veterinary practice. 42
Table 7 - Domains and subcultures of safety cultures identified within the publications included in the scoping review. 48
Table 8 - Credits awarded in accordance with SVMS policy (University of Nottingham, 2024a) 112
Table 9 - Theme 1 - understanding. 121
Table 10 - Theme 2 - operational aspects 135
Table 11 - Theme 3 - control 139
Table 12 - Theme 4 - risk 148

List of figures

Figure 1 - Cox and Cox's model of safety culture (Cox and Cox, 1991)..... 18
Figure 2 - A strategic (top down) approach to safety (Glendon and Stanton, 2000). 20
Figure 3 - An operational (bottom up) approach to safety (Glendon and Stanton, 2000). 21
Figure 4 - Model of construction safety climate (Choudhry et al., 2007a) with Cooper (2000) original model in blue. 23
Figure 5 - The Egg Aggregated Model of safety culture (Vierendeels et al., 2018). 25
Figure 6 - A proposed model of safety climate and injury outcomes (Flin, 2007). 26
Figure 7 - A hospital culture of patient safety (Sammer et al., 2010). 28
Figure 8 - PRISMA-Scoping Review flow diagram outlining the process used for a scoping review of the current literature on veterinary safety culture. 41
Figure 9 - A scatter chart depicting the chronological distribution of all included publications. 42
Figure 10 - A histogram depicting the included literature by publication type and patient or staff safety focus. Total number of publications n=106. 43
Figure 11 - A histogram detailing frequency of subcultures as defined by Sammer et al. (2010), total number of publications n=90, total number of codes n=149..... 44
Figure 12 - A histogram detailing the frequency of domains as defined by Vierendeels et al. (2018). Total number of publications n=16, total number of codes n=34. 44
Figure 13 - A histogram depicting the frequency of codes for patient safety related publications. 45
Figure 14 - A histogram depicting the frequency of codes for staff safety related publications. 47
Figure 15 - A histogram showing the number of interviewees by profession and area of practice. 67
Figure 16 - The initial thematic diagram. Key: Arrows signal a relationship between themes, arrow direction signals the direction of influence, double arrows signify that themes are interdependent. 68
Figure 17 - The final thematic diagram depicting the factors that influence veterinary staff's experience of safety culture. Key: Arrows signal a relationship between themes; arrow direction signals the direction of influence. 69

Record of publications

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Chapter 1: Introduction

1.1 Introduction to safety culture

The field of veterinary safety culture is in its infancy, with only limited research available. In contrast, safety culture is a well-established subject in safety-critical industries such as medicine, nuclear power, aviation, and construction. Within medicine, patient safety became a topic of conversation following the landmark report *To Err is Human* (Kohn et al., 2000), which highlighted the profound impact that safety culture has on patient outcomes and patient trust. The significance of safety culture is exemplified by the National Health Service (NHS), who estimated that safety incidents cause approximately 11,000 deaths annually (Hogan et al., 2015). Consequently, patient safety culture is now a cornerstone of the NHS patient safety strategy and it is believed that it will save an extra 1,000 lives per year, £100 million in care costs per year, and reduce claims provision by around £750 million per year (NHS, 2019). Although veterinary medicine shares many similarities with medicine, it has been suggested that its safety culture is behind that of medicine's (Wallis et al., 2019). Nevertheless, important aspects of safety culture have been researched and implemented into veterinary practice, showing that it is possible to learn from other safety-critical industries and use these lessons to improve veterinary safety culture.

1.2 What is safety culture?

1.21 Safety culture and organisational culture

Understanding organisational culture is paramount to understanding safety culture as the latter is widely considered a sub-facet of the former (Kennedy and Kirwan, 1998, Cooper, 2000, Glendon and Stanton, 2000, Mohamed, 2003, Choudhry et al., 2007b). Organisational culture, however, is a term that is not easily defined (Flamholtz, 2001), with significant variation found in the literature (Hartmann and Patrickson, 1995). Despite this variation, existing definitions and views are split into two distinct paradigms – the functionalist (sociological) and interpretive (anthropological) views (Burrell and Morgan, 1985).

The interpretive paradigm asserts that an organisation *is* its culture (Geertz, 1973, Alvesson, 2012). Frost (1985) defines organisational culture as the 'importance for people of symbolism – of rituals, myths, stories and legends – and about the interpretation of events, ideas, and experiences that are influenced and shaped by the groups within which they live.' Alvesson (2012) endorses this definition, underscoring that culture is something intrinsic to an organisation, and not a tool to be used. Instead, culture is seen as the glue that binds an organisation together (Alvesson, 2012) and emerges from the collective experiences of those within the organisation and develops in response to individual interpretations and interactions. This view not only emphasises the significant role of employees, however, also suggests that managers cannot unilaterally define or control organisational culture.

On the other hand, in the functionalist paradigm, culture is viewed as something an organisation *has* (Smircich, 1983, Cameron, 2011). In this view, culture is perceived as a malleable construct that can be influenced by shaping organisational values, norms, rituals, and symbols to create a cohesive and motivating environment that promotes desired behaviours and outcomes (Cameron, 2011, Deal, 2000, Schein, 2016). This view of organisational culture is closely aligned with a managerialist approach which operates under the assumption that culture can be objectively analysed, measured, and manipulated (Kotter, 1992). Such an approach views managers as having the tools and authority to design and control an organisation's culture. It extends to align training, communication, and leadership in order to provide guidance and to reinforce cultural norms deemed essential for organisational success (Denison, 1990). Such a view is seen in Schein (2016), where he defines organisational culture as:

> *The accumulated shared learning of that group as it solves its problems of external adaptation and internal integration, which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, feel, and behave in relation to those problems.*

This definition highlights the role of teaching/training in the development of culture and therefore, suggests the significant importance of managers in shaping organisational culture as they are responsible for training.

Despite the distinct nature of these two paradigms, a more nuanced understanding of organisational culture may be achieved by embracing both. Schultz and Hatch (1996) introduced the interplay model, which accepts these paradigms as inherent yet interconnected parts of the culture. This interconnectedness emerges from shared modernist characteristics within both paradigms, which can be categorised as seeing culture as a pattern, essence, and static entity. These concepts are further detailed in Table 1.

Table 1 - Connections between functionalism and interpretivism (Schultz and Hatch, 1996).

Connecting Assumptions	Functionalism	Interpretivism
Culture as a Pattern	A pattern of values or basic assumptions.	A worldwide or webs of significance.
Culture as Essence	Discovering the deep level of culture makes it possible to decipher visible and espoused levels of culture.	Interpreting the symbolic expressions and representations of deep layers of meaning.
Culture as Static	Predictable, linear, deterministic stages of development.	Interrelated, circular relations between interpretations and meaning.

Rather than attempting to resolve the tensions between the paradigms, the interplay strategy celebrates their coexistence, allowing for a richer, multifaceted view of organisational culture. This perspective, recognising the independent yet mutually dependent existence of both paradigms, is the view that the author also advocates in understanding both safety culture and culture more broadly.

1.22 Defining safety culture

While the understanding of organisational culture is divided into paradigms, it is essential to recognise that these cultural frameworks extend to specific domains within the organisation, notably safety.

Safety culture was first used by the International Nuclear Safety Advisory Group (INSAG) following the Chernobyl nuclear accident in 1986. The recognition of the 'absence of safety culture' in the INSAG-1 report (INSAG, 1992) altered the way in which safety is viewed not only as a set of guidelines but as a crucial aspect of an organisation. Despite being a sub-facet of organisational culture, safety culture is unique from organisational culture and subsequently a multitude of definitions (Table 2) exist, demonstrating its complexity. Simply put, safety culture has been defined as 'the way we do things around here' (CBI, 1990), however, more nuanced interpretations see it as the relationship between factors that impact how safety is regarded in an organisation (Table 2). This understanding is taken further by some authors, who assert that organisations with a positive safety culture place safety as a goal above all else (INSAG, 1991, Hale, 2000, NRC, 2011).

Although there is a relationship between organisational culture and safety culture, the two terms are not interchangeable with Pidgeon (1991) asserting that safety culture has both social and technical aspects in contrast to organisational culture which is wholly social. This distinction blurs the lines between these two paradigms and as a result there are significant differences in the literature regarding both the definition and methods of changing safety culture (Clarke, 2000, Davies et al., 2000).

Despite the vast quantity and variation in definition, there is consensus as the definitions broadly fall into the interpretive or functionalist paradigms. The functionalist view often emphasises safety culture as a tangible set of practices and procedures that can be directly managed and controlled to ensure the safety of employees and the organisation (Turner et al., 1989, HSC, 1993). However, the interpretive view sees safety culture as an evolving

phenomenon, shaped by the collective values, beliefs, and perceptions of the individuals within an organisation (Cox and Cox, 1991, Lee, 1998). This contrast reflects the broader debate within organisational culture and leads to varied approaches in defining safety culture.

Table 2 - Definitions of safety culture.

Reference	Definition of Safety Culture
Turner et al. (1989)	The set of beliefs, norms, attitudes, roles, and social and technical practices that are concerned with minimising the exposure of employees, managers, customers, and members of the public to conditions considered dangerous or injurious.
Health and Safety Commission (HSC) (1993)	The product of individual and group values, attitudes, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation's health & safety programmes.
Cox and Cox (1991)	Safety cultures reflect the attitudes, beliefs, perceptions, and values that employees share in relation to safety.
International Nuclear Safety Advisory Group (INSAG) (1991)	Safety culture is that assembly of characteristics and attitudes in organisations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance.
Confederation of British Industry (CBI) (1990)	The way we do things around here.

Reference	Definition of Safety Culture
Ostrom et al. (1993)	The concept that the organisation's beliefs and attitudes, manifested in actions, policies, and procedures, affect its safety performance.
Geller (1994)	In a total safety culture (TSC), everyone feels responsible for safety and pursues it on a daily basis.
Lee (1998)	The collective commitment to safety. It is expressed through not only safe behaviour but also the relatively enduring attitudes that govern behaviour. To extend the CBI definition-it is 'the way we look at things and the way we do things around here '.
Kennedy and Kirwan (1998)	An abstract concept, which is underpinned by the amalgamation of individual and group perceptions, thought processes, feelings, and behaviours, which in turn gives rise to the particular way of doing things in the organisation. It is a sub-element of the overall organisational culture.
Hale (2000)	Refers to the attitudes, beliefs, and perceptions shared by natural groups as defining norms and values, which determine how they act and react in relation to risks and risk control systems.
Glendon and Stanton (2000)	Compromises attitudes, behaviours, norms and values, personal responsibilities as well as human resource features such as training and development.

Reference	Definition of Safety Culture
Guldenmund (2000)	Those aspects of the organisational culture which will impact on attitudes and behaviour related to increasing or decreasing risk.
Cooper (2000)	Culture is the product of multiple goal-directed interactions between people (psychological), jobs (behavioural), and the organisational (situational); while safety culture is that observable degree of effort by which all organisational members direct their attention and actions toward improving safety on a daily basis.
Mohamed (2003)	A sub-facet of organisational culture, which affects workers' attitudes and behaviour in relation to an organisation's on-going safety performance.
Richter and Koch (2004)	Shared and learned meanings, experiences, and interpretations of work and safety – expressed partially symbolically- which guide people's actions toward risk, accidents, and prevention.
Fang et al. (2006)	A set of prevailing indicators, beliefs, and values that the organisation owns in safety.
Nuclear Regulatory Commission (NRC) (2011)	Safety culture is the core values and behaviours resulting from a collective commitment by leaders and individuals to emphasise safety over competing goals to ensure protection of people and the environment.

Reference	Definition of Safety Culture
NHS (2022)	We define a positive safety culture as one where the environment is collaboratively crafted, created, and nurtured so that everybody (individual staff, teams, patients, service users, families, and carers) can flourish to ensure brilliant, safe care by: i) Continuous learning and improvement of safety risks ii) Supportive, psychologically safe teamwork iii) Enabling and empowering speaking up by all
Health and Safety Executive (HSE) (2023a)	Safety culture is a combination of the attitudes, values and perceptions that influence how something is actually done in the workplace, rather than how it should be done.

However, it is essential to recognise that these definitions may not apply uniformly to all organisations. Safety-critical entities will need to prioritise safety as a goal above all else, highlighting the need for safety culture to align with specific contexts (Richter and Koch, 2004). This understanding shifts the focus, altering the degree to which an organisation's culture is considered a safety culture and emphasises the necessity for tailored approaches in different industries and regulatory environments. This may account for the significant variation in how safety culture is viewed in different industries.

1.23 Models of safety culture

Researchers have proposed several models of safety culture (Cox and Cox, 1991, Glendon and Stanton, 2000, Choudhry et al., 2007a, Choudhry et al., 2007b, Vierendeels et al., 2018), that explore how social and physical factors interact and form a safety culture.

Cox and Cox (1991) suggested a model based on their research into employees' attitudes to safety. This model (Figure 1), demonstrates the shared aspects of safety culture and as a result, provides a partial description of an organisation's safety culture. The model has four key categories:

1. Hardware – which is the physical hazards that an organisation may have.
2. Software – which includes the legislation, safety management and policy.
3. People – which describes all types of employees, for example, workers, managers, supervisors, and authorities.
4. Risks – Behaviour that could be considered risky and how this is regulated.

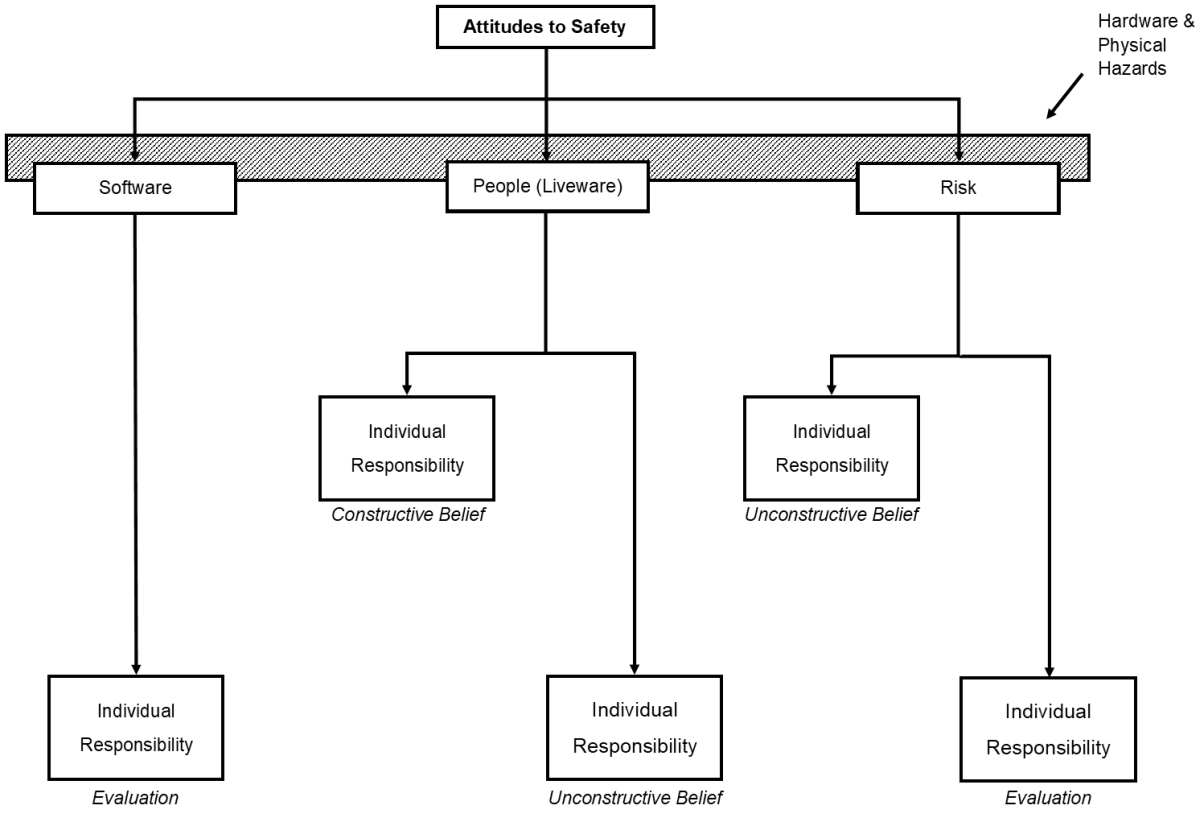


Figure 1 - Cox and Cox's model of safety culture (Cox and Cox, 1991).

Whilst the model pictorialises their definition, it has been suggested that it lacks refinement (Guldenmund, 2000). This critique may be valid, as these four dimensions are not clearly defined. Additionally, although the model emphasises the importance of shared values, beliefs, and attitudes, it does not adequately address the behavioural aspects of safety culture, such as the willingness to report hazards or to take steps to correct them. Therefore, the model proposed by Cox and Cox (1991) is perhaps not the best model for safety culture, due to its limited evaluation of the behavioural aspects of safety culture.

An alternative model of safety culture is presented by Glendon and Stanton (2000), who present a strategic (top down) approach to safety. In their model (Figure 2), safety culture is viewed as something that can be controlled and influenced from the top (i.e. management) – aligning with the functionalist view of culture and subsequently, is subject to the same weaknesses that align with the paradigm. However, Glendon and Stanton (2000) complement this model with an operational (bottom up) approach to safety (Figure 3). When the two models are combined, a strong emphasis is placed on human factors, which is the vehicle used to understand and influence the safety culture within the organisation.

While the combination of these methods offers a broad perspective and may provide insights into potential errors without waiting for incidents to occur, the bidirectional nature of it may require an intricate approach to measuring safety culture.

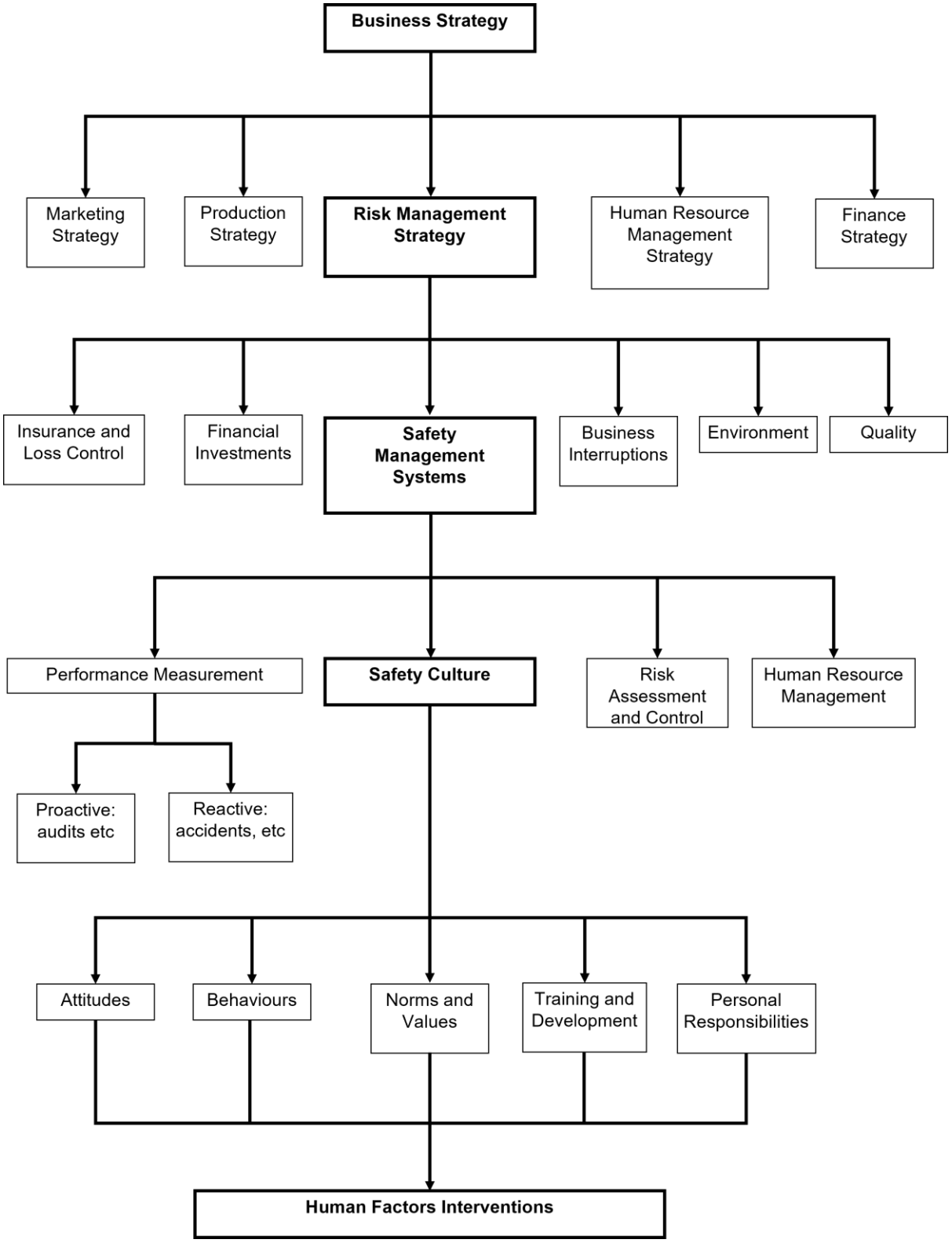


Figure 2 - A strategic (top down) approach to safety (Glendon and Stanton, 2000).

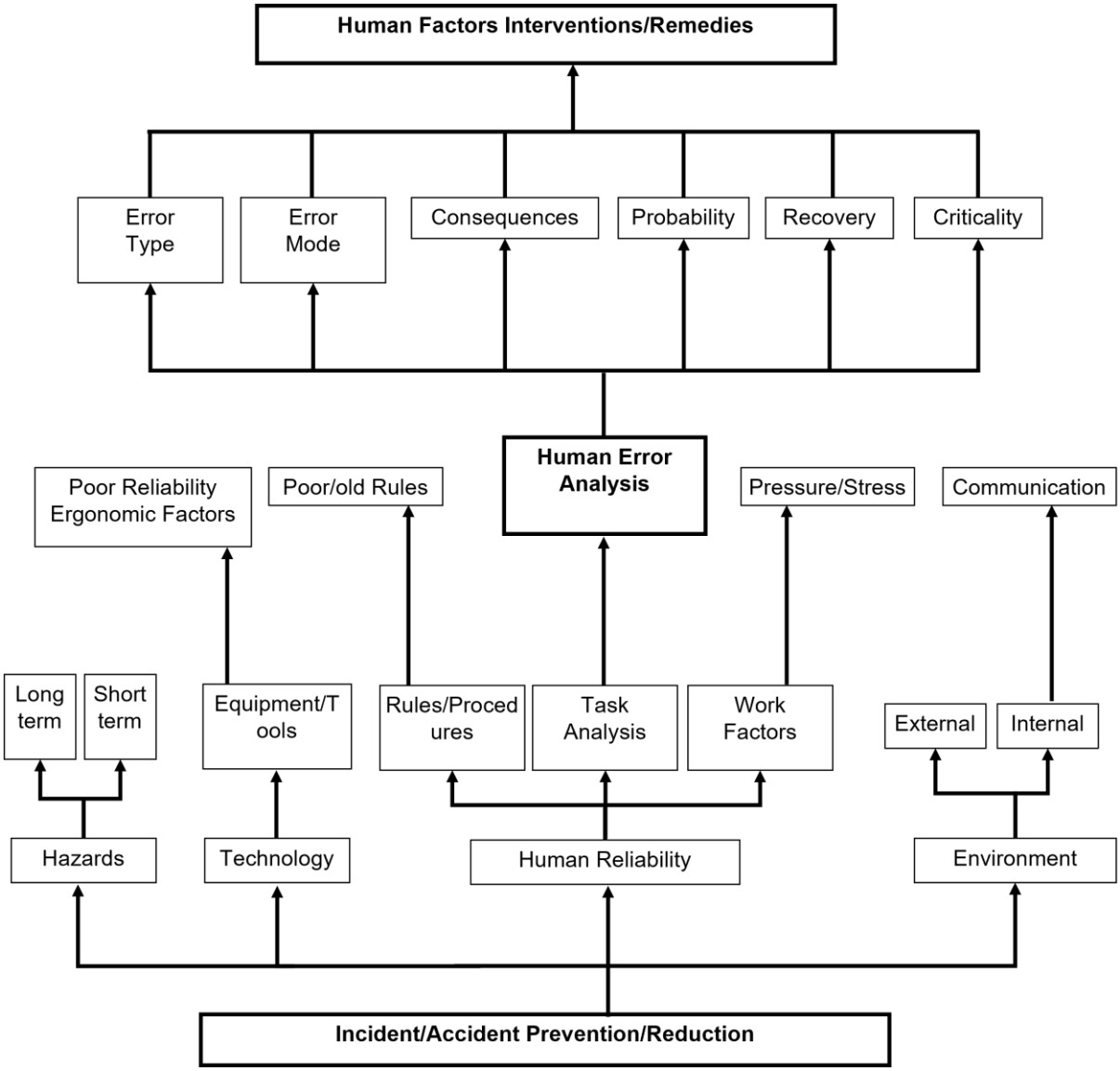


Figure 3 - An operational (bottom up) approach to safety (Glendon and Stanton, 2000).

Choudhry et al. (2007b) propose an industry-specific model of safety culture that substantially extends Cooper's (2000) reciprocal model (Figure 4). While both frameworks utilise three core constructs—person, behaviour, and environment—Choudhry et al. (2007a) enrich their model by amalgamating a broader range of safety-related factors, drawing upon earlier research to enhance their framework (Neal et al., 2000, Fleming and Lardner, 2002, Marosszeky, 2005). These factors include perceptual, psychological, behavioural, and managerial elements, aiming to create a more holistic assessment of safety culture. Choudhry et al.'s approach is multidimensional, deploying a diverse range of evaluative tools such as safety climate surveys,

behaviour-based safety (BBS) checklists, and safety systems audits. This allows for an intricate, industry-specific, multi-level analysis of a construction site’s safety culture. However, it should be noted that Choudhry et al. (2007a) model leans towards a goal-setting paradigm, a focus that might lead to short-term successes—or 'quick wins'—without necessarily fostering a long-term, sustainable improvement in an organisation's safety culture. Notwithstanding this, it is still useful for demonstrating how existing models of safety culture can be enriched to create industry-specific contexts, which could help increase the relevance, utility, and understandability of safety culture.

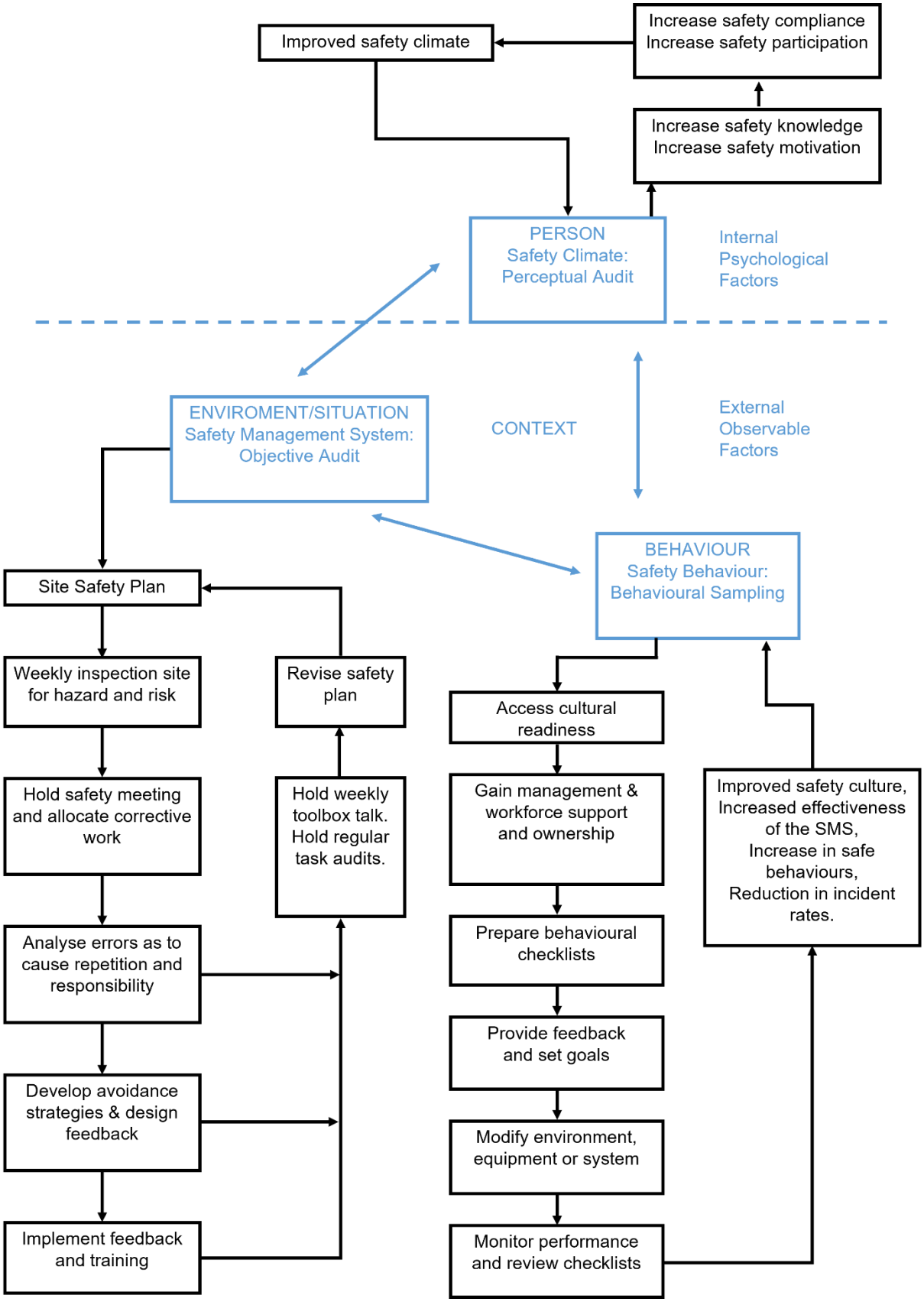


Figure 4 - Model of construction safety climate (Choudhry et al., 2007a) with Cooper (2000) original model in blue.

A newer model proposed by Vierendeels et al. (2018), combines multiple safety aspects to create a big-picture, conceptual, and all-inclusive model of safety culture termed: The Egg Aggregated Model (TEAM) of safety culture (Figure 5). The TEAM builds upon Schein (1990) three layers of safety culture by using research from Guldenmund (2000), Ostroff et al. (2003), and Zohar and Hofmann (2012). By expanding upon these, the model consists of multiple domains spanning from psychological to sociological and engineering elements. These domains are:

1. Technological domain – containing observable factors.
2. Organisational domain – perceptual (shared) factors.
3. Human domain – personal (individual) psychological factors.

The model details the complex interactions between the domains as well as those between factors within domains. The result is a complex, but all-encompassing model that encapsulates the challenge in assessing safety culture (Searle, 2023).

However, as Vierendeels et al. (2018) note, further research is needed to elaborate more on causal relationships between domains. This has been suggested through the use of surveys/questionnaires and focus groups in order to measure across all domains. Continued investigation into the model's applicability to specific industries is also needed to validate its usage. This aligns with earlier research, such as the application of Cooper (2000) reciprocal model by Choudhry et al. (2007b). Examining how TEAM performs in these specific settings could shed light on whether its complexity introduces any practical challenges in a real-world environment.

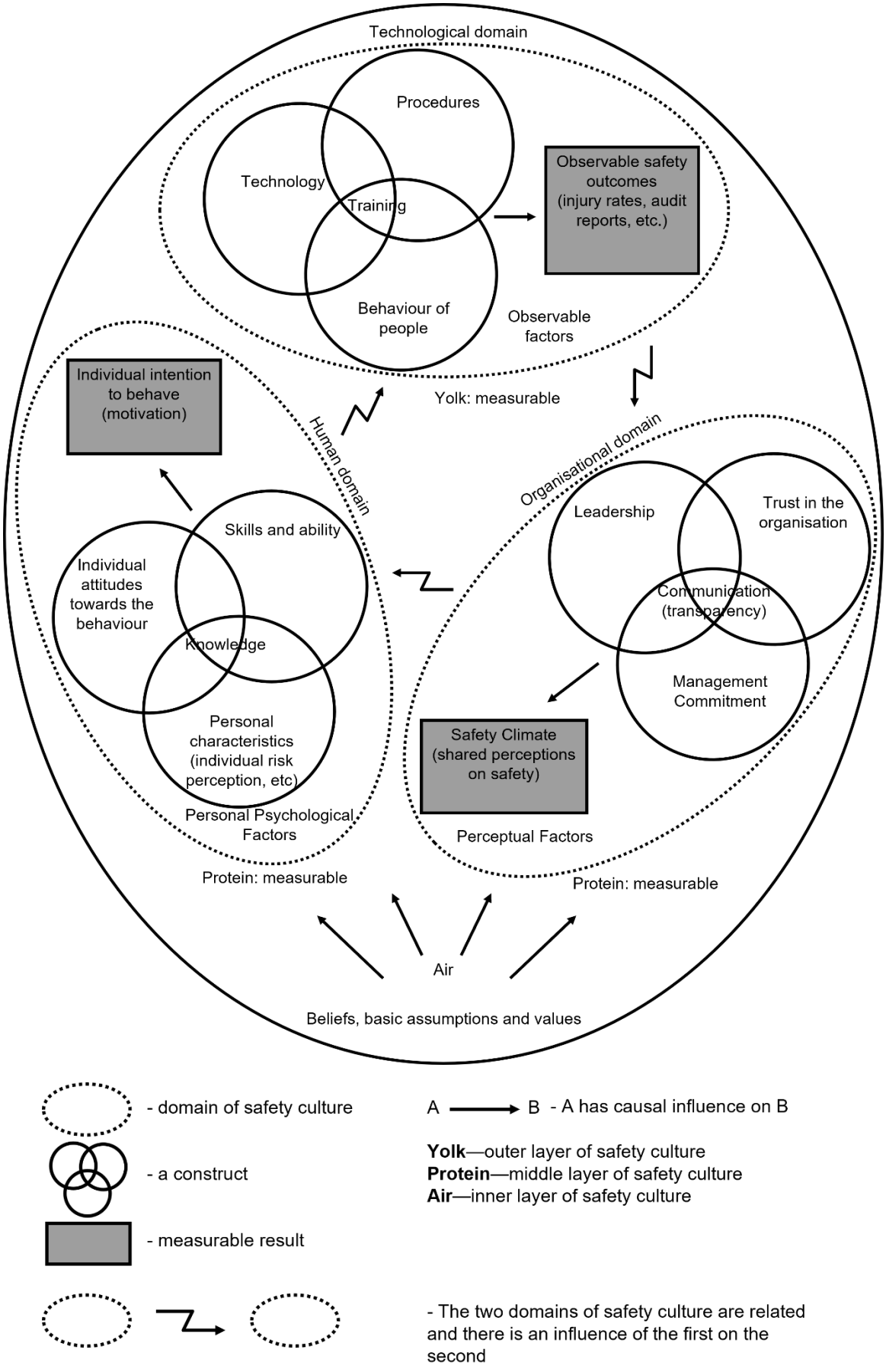


Figure 5 - The Egg Aggregated Model of safety culture (Vierendeels et al., 2018).

1.3 What is patient safety culture?

1.31 Safety culture and patient safety culture

While safety culture can be universally applied to all industries, clearly patient safety culture can only apply to industries that have patients, namely health care and veterinary medicine. The relationship between safety culture and patient safety culture is not fully explained in the literature with some using the terms interchangeably (Sammer et al., 2010, Nieva and Sorra, 2003, Hellings et al., 2010). This lack of differentiation is highlighted by Flin (2007) who describes a model (Figure 6) that differentiates patient and worker safety. In this model, both fall under the wider umbrella term of safety climate which itself is a division of safety culture (Glendon and Stanton, 2000).

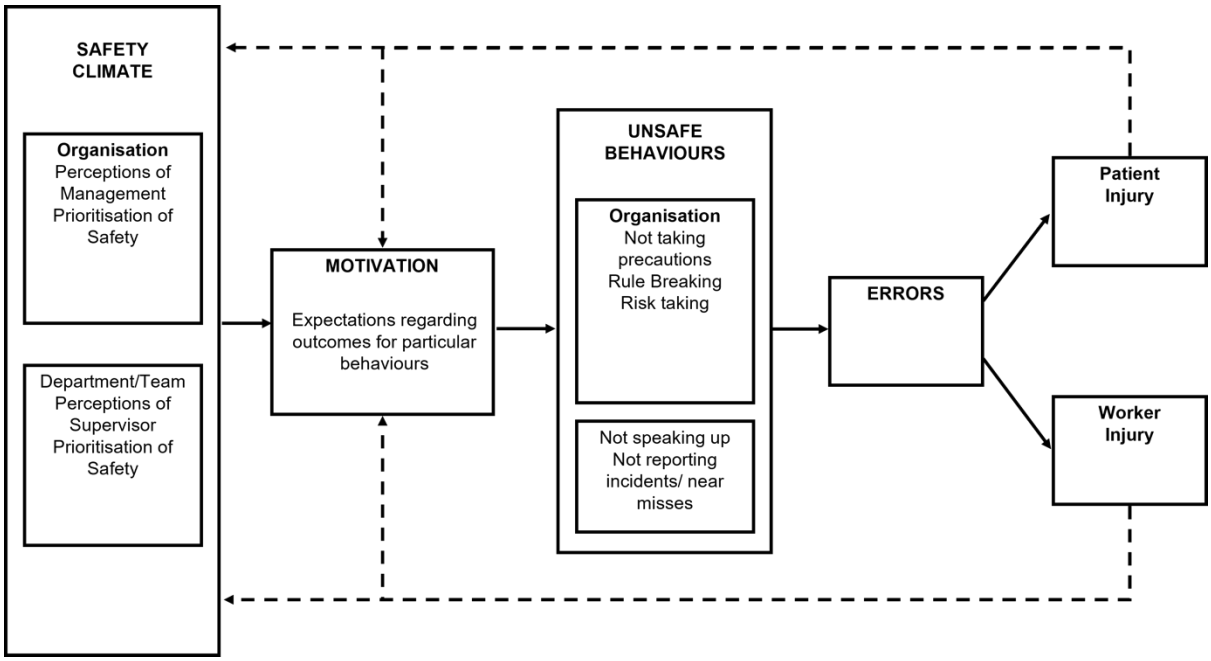


Figure 6 - A proposed model of safety climate and injury outcomes (Flin, 2007).

The concept of patient safety culture is markedly different from that of patient safety, just as safety culture is distinct from safety itself. Patient safety is defined by the NHS (2023) as the 'avoidance of unintended or unexpected harm to people during the provision of health care'. While this definition focuses largely on patient outcomes, the concept of patient safety culture

extends beyond this. It encompasses a broader range of factors, aligning more with the general definition of safety culture (Sammer et al., 2010, Yamalik and Perea Pérez, 2012).

Research conducted by Sammer et al. (2010) identified several key constituent components of patient safety culture (Figure 7). In this model, patient safety culture is divided into seven subcultures:

1. Teamwork.
2. Evidence based.
3. Leadership.
4. Communication.
5. Learning.
6. Just.
7. Patient centred.

Each of these subcultures are further divided into properties which are essential for creating a culture of patient safety.

Notably, parallels can be drawn between this framework and existing models or definitions of safety culture. For instance, prioritising a patient-centred approach, where patient safety takes precedence, aligns well with the definitions set by both INSAG (1991) and NRC (2011) where safety is the overriding aim above all other goals.

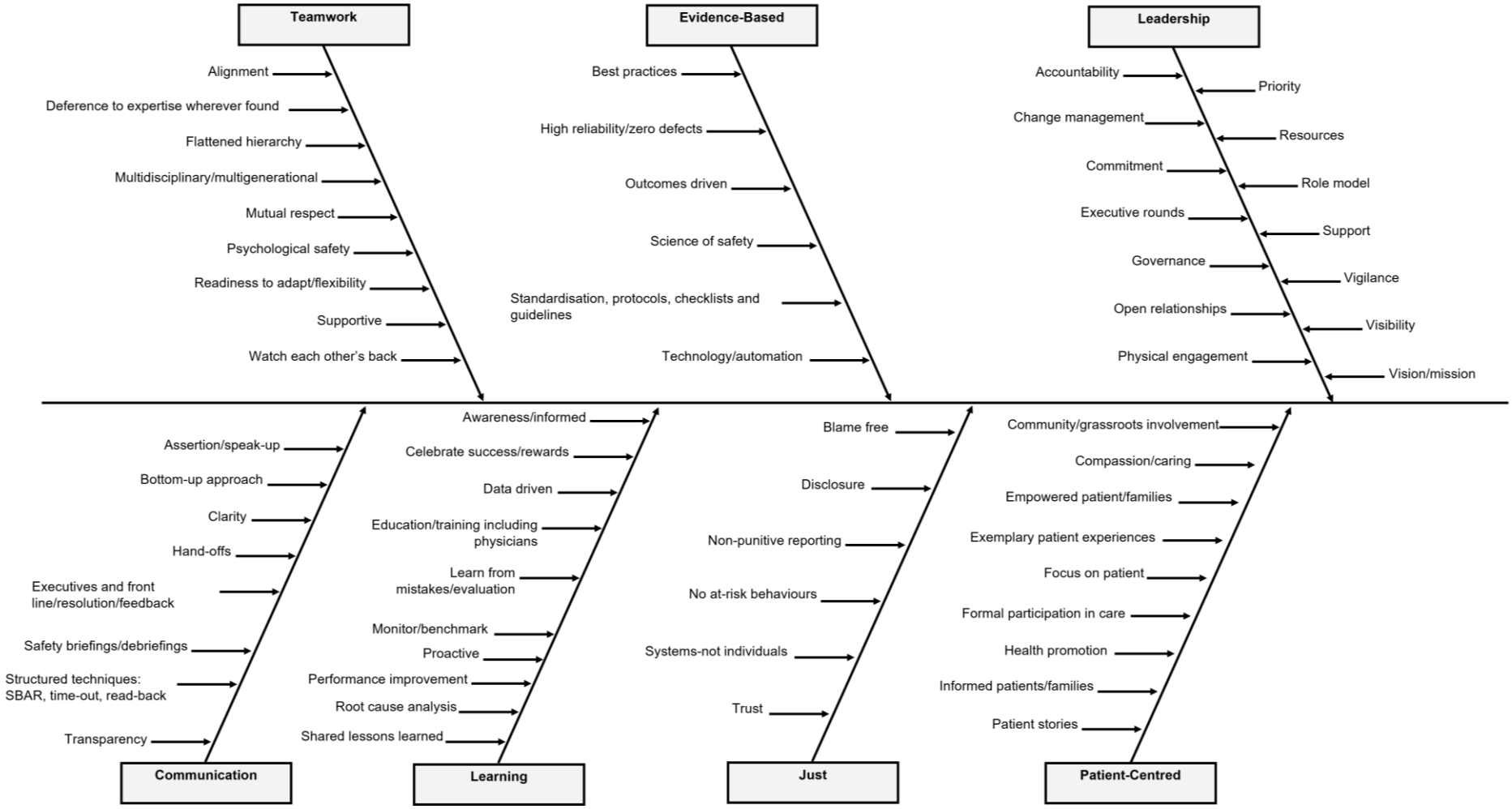


Figure 7 - A hospital culture of patient safety (Sammer et al., 2010).

1.32 Veterinary safety culture

The topic of veterinary safety culture has been under explored, lacking both formal definitions and comprehensive models. Existing literature has considered individual subcultures or properties – as outlined by Sammer et al. (2010), but no formal review has taken place to fully assess how far the industry has progressed in this vital area. As a result, further research in the form of a scoping review is warranted to fully ascertain the level of previous research completed in the field and to identify gaps in our understanding of veterinary safety culture.

1.4 Aims

In order to investigate veterinary safety culture, the following broad aims were devised to guide the research:

- To explore the current literature on veterinary safety culture.
- To understand the profession's perceptions of veterinary safety culture.

Chapter 2: Investigating veterinary safety culture - a scoping review

2.1 Introduction

Safety culture within the veterinary profession is often associated with practices such as checklists and error reporting, as highlighted by McMillan (2014a), and Turner (2021). While these elements are important components, they represent just a fraction of the broader spectrum of safety culture, as delineated by Sammer et al. (2010) and Vierendeels et al. (2018). Recognising this broad spectrum of safety culture is crucial for creating a culture where veterinary staff avoid incidents that cause harm to both patients and staff. The existing literature, seemingly focused primarily on discrete aspects of safety culture, suggested an opportunity for a comprehensive exploration. As a result, a scoping review was conducted with the aim of mapping the current research landscape and identifying significant gaps in the understanding of safety culture. Consequently, the following research question was formulated:

What areas of veterinary safety culture are explored by the literature?

2.2 Aims and objectives

The following aim and objectives were devised to answer the research question.

Aim:

- To conduct a scoping review of all publications which discuss veterinary safety culture.

Objectives:

To extract from the publications obtained via the scoping review:

1. The demographic distribution of the literature.
2. How staff safety considered by the literature.
3. Do tools exist for the measurement of safety culture.

2.3 Methods

2.31 Protocol and registration

The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines for scoping reviews (PRISMA, 2023) was used to draft a protocol. The Joanna Briggs Institute methodology (Peters et al., 2020), which the primary researcher had completed the accredited training program for, was followed throughout. The protocol underwent review by both the primary (TC) and secondary researcher (KW) before the initial searches were conducted. Open Science Framework (OSF, 2023) was used to register the final protocol in September 2023, following refinement of the initial search terms. This review was approved by the University of Nottingham School of Veterinary Medicine and Science (SVMS) Science ethics committee (Approval number: 3894 230726).

2.32 Eligibility criteria

For literature to be included in the scoping review, publications needed to focus on safety culture, as defined and modelled by Sammer et al. (2010) for patients and Vierendeels et al. (2018) for staff. Only peer-reviewed publications were included within the search and there was no date limit imposed. Inclusion and exclusion criteria for both title/abstract and full text screening are outlined in Table 3, and were agreed on by both the primary and secondary researcher.

Table 3 - Inclusion and exclusion criteria.

Criteria	Inclusion	Exclusion
Population	Veterinary surgeons	Farmers
	Registered Veterinary Nurses (RVNs)	Farms
	Veterinary students	Laboratory staff
		Diagnostic labs

Criteria	Inclusion	Exclusion
	Student Veterinary Nurses (SVNs)	Research labs
	Veterinary surgeries	Pharmacist
	Veterinary hospitals	Human drug trials
	Veterinary schools	
Interest	Publications that describe or investigate: safety culture as a whole, a domain, or a construct as defined and modelled by Vierendeels et al. (2018).	Publications that describe or investigate how treatments whether surgical or medical improve patient safety.
	Publications that describe or investigate safety culture as a whole, the sub-cultures or properties as defined and modelled by Sammer et al. (2010)	Publications that describe or investigate the use of checklists to classify.
Context	Publications that detail safety culture in the context of veterinary medicine.	Publications that detail safety culture in the context of wider health sciences.
		Publications not related to safety culture.
Publication types	Peer-reviewed publications, conference proceedings where a full report is available, posters.	Non-peer reviewed publications.
		Textbooks
		Grey literature

Criteria	Inclusion	Exclusion
		Unable to obtain full text Letters to the journal
Language	Full text available in English	

2.33 Information sources

Guidance set out by Grindlay et al. (2012) was followed in selecting CAB Abstracts - via Ovid (2023), Scopus (Elsevier, 2023) and PubMed (NCBI, 2023) as the databases to search. This resulted in virtually complete coverage of the Basic List of Veterinary Medical Serials, Third Edition (Ugaz et al., 2010), and 91% of the extensive list of active veterinary journals. Additional searches were conducted in the prominent veterinary journals: British Veterinary Association (BVA) journals (In Practice and Vet Record) (Wiley, 2023), and Veterinary Anaesthesia and Analgesia (Science Direct, 2023) to minimise the risk of missing relevant papers.

2.34 Search terms

Search terms were drafted by TC and reviewed by KW; no problems were identified. The searches were executed in September 2023 using the search terms outlined in Table 4.

Table 4 - Search terms.

Database	Search term
CAB Abstracts	(((veterinar* or vets or vets or "animal care" or "animal health") AND ("safety training" or "safety policy" or checklists or "safety rules" or "quality maintenance" or "accident reporting" or "incident reporting" or "safety meetings" or ("manager's actions" or "manager's attitudes" or

Database	Search term
	"blaming workers for accidents" or "just culture") or ("vets attitudes" or "RVNs attitudes" or "personal beliefs about risk and safety" or "individual responsibility" or "evaluation of safety measures" or "evaluation of work environment") or mistake or ("patient safety" or "safety priority" or "safety culture" or "organisational culture" or "safety climate"))) NOT (food or ectoparasites or endoparasites or taxonomy or epidemiology))
Scopus	TITLE-ABS-KEY ((veterinar* OR vets OR vet OR "animal care" OR "animal health") AND ("safety training" OR "safety policy" OR checklists OR "safety rules" OR "quality maintenance" OR "accident reporting" OR "incident reporting" OR "safety meetings" OR ("manager's actions" OR "manager's attitudes" OR "blaming workers for accidents" OR "just culture") OR ("vets attitudes" OR "RVNs attitudes" OR "personal beliefs about risk and safety" OR "individual responsibility" OR "evaluation of safety measures" OR "evaluation of work environment") OR mistake OR("patient safety" OR "safety priority" OR "safety culture" OR "organisational culture" OR "safety climate")) AND NOT (food OR ectoparasites OR endoparasites OR taxonomy OR "infectious diseases" OR "animal diseases" OR epidemiology))

Database	Search term
PubMed	((veterinary*[Title/Abstract] OR vet Title/Abstract] OR vets Title/Abstract] OR "animal care"[Title/Abstract] OR "animal health"[Title/Abstract]) AND ("safety training"[Title/Abstract] OR "safety policy"[Title/Abstract] OR checklists[Title/Abstract] OR "safety rules"[Title/Abstract] OR "quality maintenance"[Title/Abstract] OR "accident reporting"[Title/Abstract] OR "incident reporting"[Title/Abstract] OR "safety meetings"[Title/Abstract] OR ("manager's actions"[Title/Abstract] OR "manager's attitudes"[Title/Abstract] OR "blaming workers for accidents"[Title/Abstract] OR "just culture"[Title/Abstract]) OR ("vets attitudes"[Title/Abstract] OR "RVNs attitudes"[Title/Abstract] OR "personal beliefs about risk and safety"[Title/Abstract] OR "individual responsibility"[Title/Abstract] OR "evaluation of safety measures"[Title/Abstract] OR "evaluation of work environment"[Title/Abstract]) OR ("patient safety"[Title/Abstract] OR "safety priority"[Title/Abstract] OR mistakes OR "safety culture"[Title/Abstract] OR "organisational culture"[Title/Abstract] OR "safety climate"[Title/Abstract])) NOT (food[Title/Abstract] OR ectoparasites[Title/Abstract] OR endoparasites[Title/Abstract] OR taxonomy[Title/Abstract] or epidemiology[Title/Abstract]))

Database	Search term
Veterinary anaesthesia and analgesia	(("veterinary" OR "vets" OR "vet" OR "animal care" OR "animal health") AND ("safety training" OR "safety policy" OR "checklists" OR "safety rules" OR "quality maintenance" OR "accident reporting" OR "incident reporting" OR "safety meetings" OR ("manager's actions" OR "manager's attitudes" OR "blaming workers for accidents" OR "just culture") OR ("vets attitudes" OR "RVNs attitudes" OR "personal beliefs about risk and safety" OR "individual responsibility" OR "evaluation of safety measures" OR "evaluation of work environment") OR "mistake" OR ("patient safety" OR "safety priority" OR "safety culture" OR "organisational culture" OR "safety climate")) AND NOT ("food" OR "ectoparasites" OR "endoparasites" OR "taxonomy" OR "epidemiology"))
Veterinary Record (All BVA journals)	(("veterinary" OR "vets" OR "vet" OR "animal care" OR "animal health") AND ("safety training" OR "safety policy" OR "checklists" OR "safety rules" OR "quality maintenance" OR "accident reporting" OR "incident reporting" OR "safety meetings" OR ("manager's actions" OR "manager's attitudes" OR "blaming workers for accidents" OR "just culture") OR

Database	Search term
	("vets attitudes" OR "RVNs attitudes" OR "personal beliefs about risk and safety" OR "individual responsibility" OR "evaluation of safety measures" OR "evaluation of work environment") OR "mistake" OR ("patient safety" OR "safety priority" OR "safety culture" OR "organisational culture" OR "safety climate")) AND NOT ("food" OR "ectoparasites" OR "endoparasites" OR "taxonomy" OR "epidemiology"))

2.35 Selection of sources of evidence

After importing the results into Rayyan (Mourad Ouzzani, 2016), a combination of artificial-intelligence (AI) tools, including Rayyan's AI duplicate resolver (Mourad Ouzzani, 2016), and manual checks were employed to remove duplicate entries. The AI duplicate resolver was used for all articles with a similarity rating above 95% with the primary researcher completing spot checks to ensure accuracy. All duplicates with a similarity rating below 95% were checked manually. Following this, articles were uploaded to Covidence and underwent full article screening. The screening process involved a comprehensive review of titles, abstracts, and full texts (where necessary), for all publications identified in the search. Both TC and KW conducted this screening independently, resolving any discrepancies through discussion to enhance the validity of the results. This also negated the need for a calibration exercise as both reviewers reviewed all results.

2.36 Data charting process

The data charting process was completed in Covidence (Veritas Health Innovation, 2023) with screened publications read and assessed in full so that all relevant information could be extracted and charted. The primary researcher and secondary researcher collaboratively developed the data charting form. After which, the primary researcher charted all articles independently. The secondary researcher conducted spot checks on five articles (approximately 5%) to ensure that data charting was conducted consistently.

To ensure consistent and reliable coding and categorisation, the safety culture frameworks proposed by Sammer et al. (2010) for patient safety-focused articles and the constructs from Vierendeels et al. (2018) for staff safety-focused articles were employed. Using these pre-existing models as the codebook for deductive coding enhanced the accuracy and reliability of the analysis of safety culture in the veterinary literature.

2.37 Data items

The following data items were extracted from the literature:

- Type of article.
- Article title.
- Publication author(s).
- Area of origin.
- Area of practice.
- Patient or staff safety focused.
- Domain (staff safety) or subculture (patient safety) of safety culture.
- Construct of safety culture (if an applicable domain is selected).
- Property of safety culture (if an applicable subculture is selected).
- Ethical approval (research studies only).
- Description of statistics performed (research studies only).

- Description of research techniques (research studies only).
- Number of participants/animals involved (research and case studies only).
- Species/breed of animals involved (research and case studies only).
- Number of rounds/groups involved (research studies only).
- Type of mistake (case studies only).
- Level of harm caused (case studies only).
- Summary of literature.
- Recommendations of literature (research and case studies only).

2.38 Synthesis of results

Publications were first classified as pertaining to either the staff or patient aspect of veterinary safety culture. Following this classification, they were deductively coded using the subcultures/properties outlined by Sammer et al. (2010) for patient safety-related content and the domains/constructs developed by Vierendeels et al. (2018) for staff-focused content. Descriptive statistics were then employed using Excel (Microsoft, 2023) to analyse these data, providing a quantitative summary.

2.4 Results

2.41 Selection of sources of evidence

A total of 1,500 articles were initially identified from the searches of three databases and two journal sites. After removing duplicates, 1,163 articles remained for title and abstract screening. Of the 1,163 articles, 711 did not align with the areas of interest, 220 focused on an incorrect population, 67 were of an inappropriate publication type (such as interviews or conference proceedings), 21 did not fit the desired context, and three were in a language other than English.

A total of 141 articles underwent full-text screening. At this stage, additional exclusions were made: 18 articles were removed due to publication type (e.g. full text not available), 12 for context, and four for not meeting the interest criteria.

Ultimately, 106 articles were included for analysis. This included five case reports, 58 opinion articles, 42 research articles, and one poster. The PRISMA-Scoping Review flow diagram is illustrated in Figure 8.

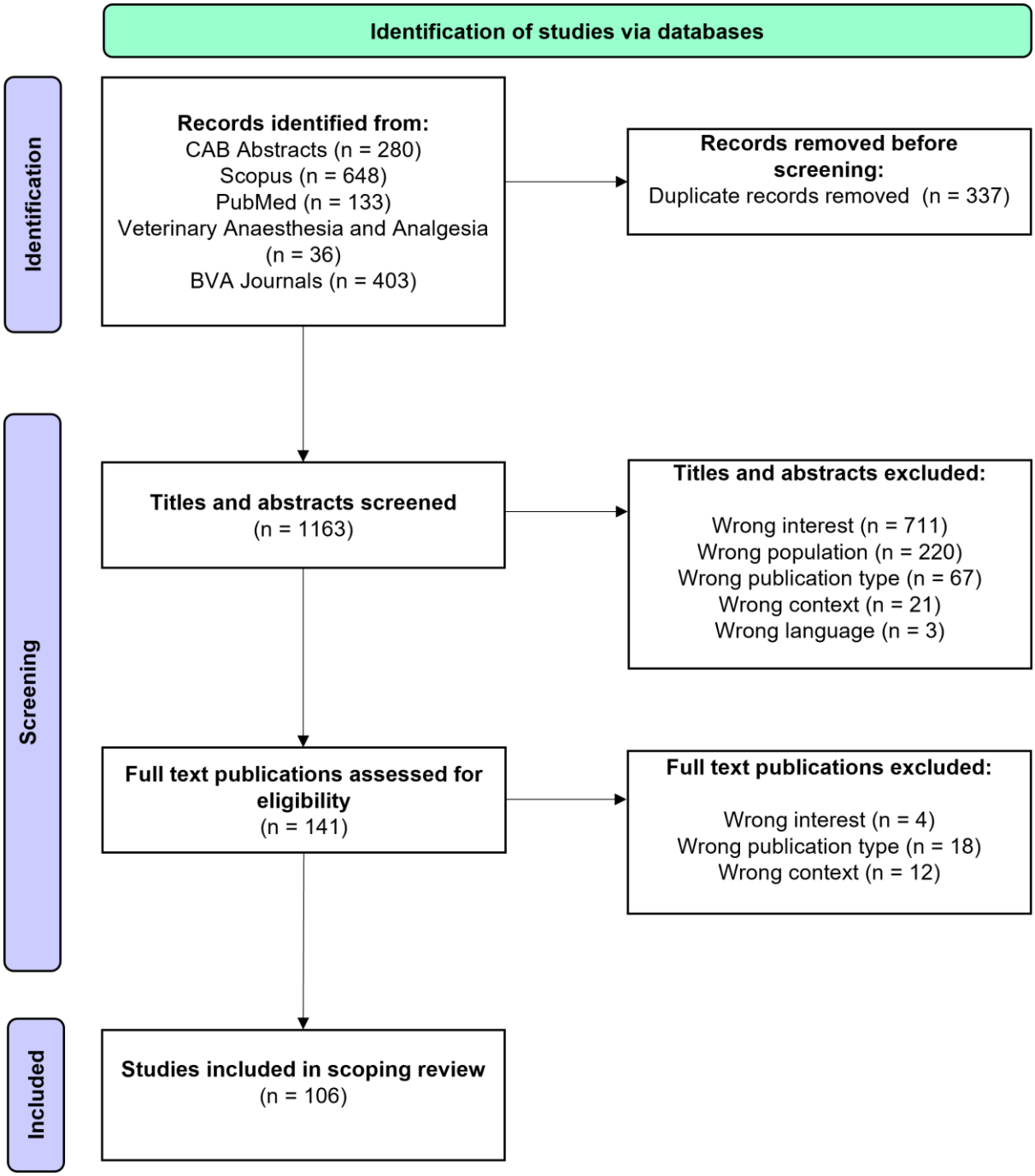


Figure 8 - PRISMA-Scoping Review flow diagram outlining the process used for a scoping review of the current literature on veterinary safety culture.

2.42 Demographic data

The geographical spread, chronological spread and type of veterinary practice are described in Table 5, Figure 9 and Table 6 respectively.

Table 5 - The global distribution of the included literature.

Area of origin	Number of articles
UK	67
USA and Canda	31
Europe	7
Africa	1

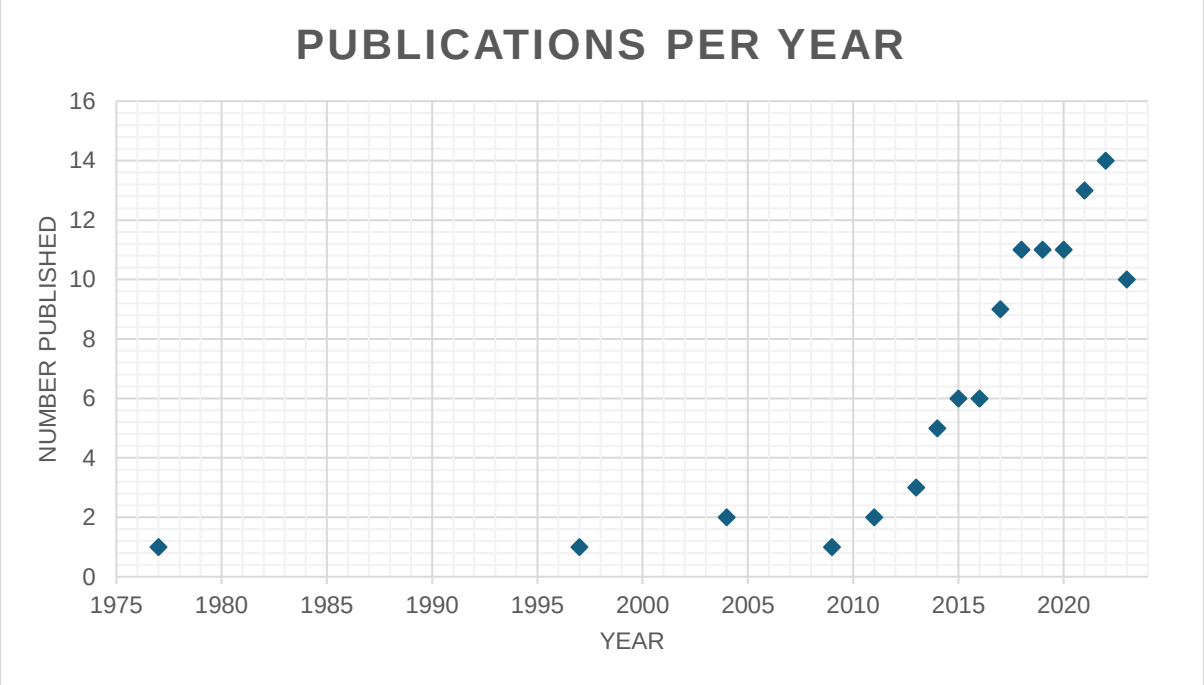


Figure 9 - A scatter chart depicting the chronological distribution of all included publications.

Table 6 - The distribution of included literature by type of veterinary practice.

Area of practice	Number of articles
Unspecified	41
Mixed	4
Equine	10

Area of practice	Number of articles
Farm	8
Small animal	59

2.43 Characteristics of sources of evidence

All 106 articles analysed in the scoping review are detailed in Appendix 3 - Scoping review results extract.

2.431 Patient and staff safety

The distribution of the literature by both its focus (staff or patient) and publication type (Figure 10).

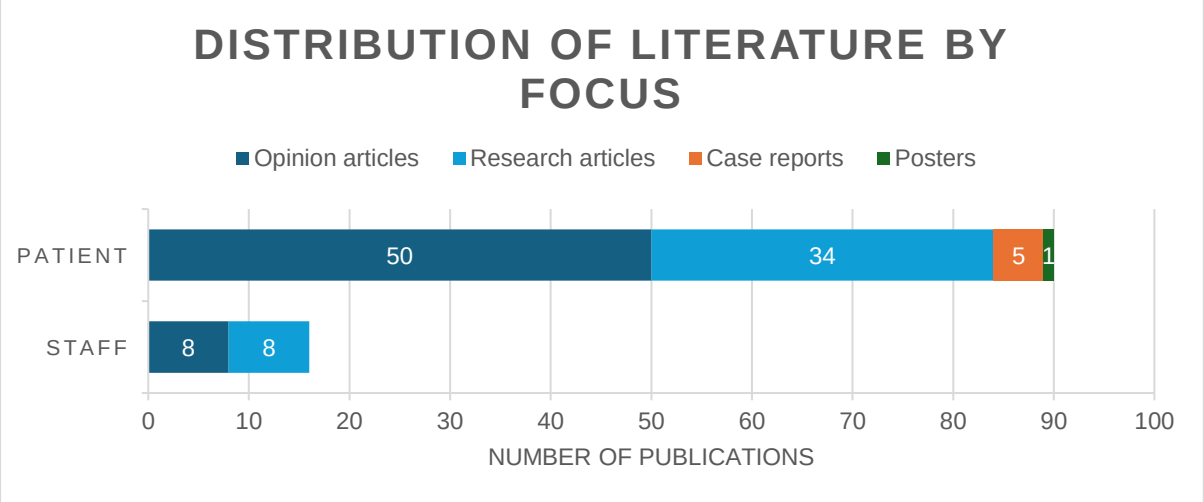


Figure 10 - A histogram depicting the included literature by publication type and patient or staff safety focus. Total number of publications n=106.

2.432 Frequency of subculture and domain

Both Figure 11 and Figure 12 describe the literature according to the frequency of codes: subcultures for patient focused and domains for staff focused publications. Some articles discussed more than one subculture/domain and therefore, the number of codes (n=183) is greater than the number of publications (n=106).

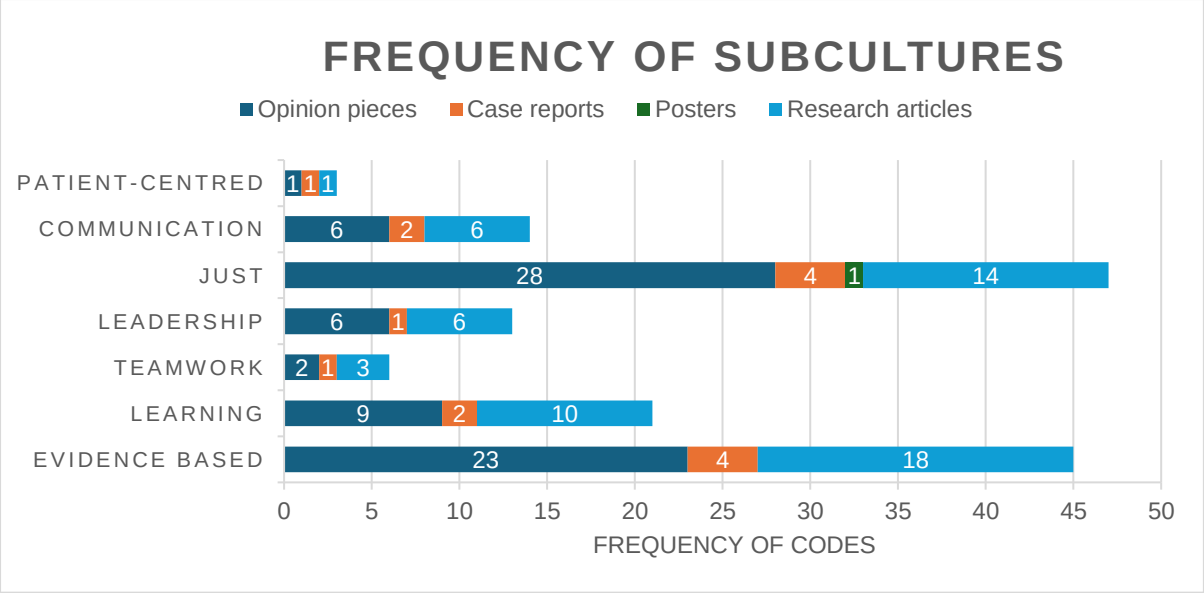


Figure 11 - A histogram detailing frequency of subcultures as defined by Sammer et al. (2010), total number of publications n=90, total number of codes n=149.

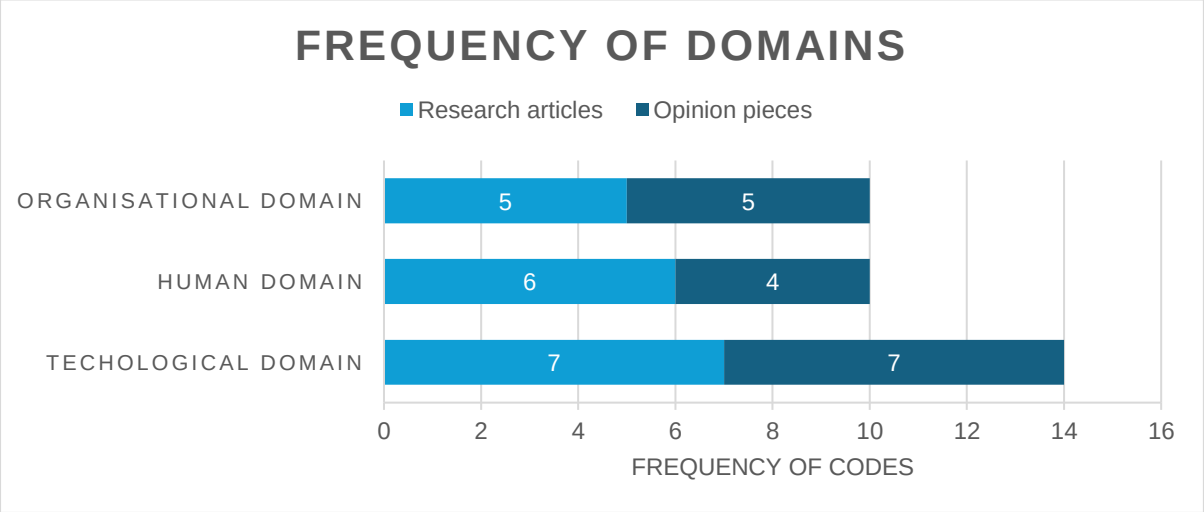


Figure 12 - A histogram detailing the frequency of domains as defined by Vierendeels et al. (2018). Total number of publications n=16, total number of codes n=34.

2.433 Frequency of properties

The most widely researched property is standardisation, protocols, checklists, and guidelines (Figure 13). In contrast, the patient-centred subculture stands out as a significant exception, being notably underrepresented in the literature.

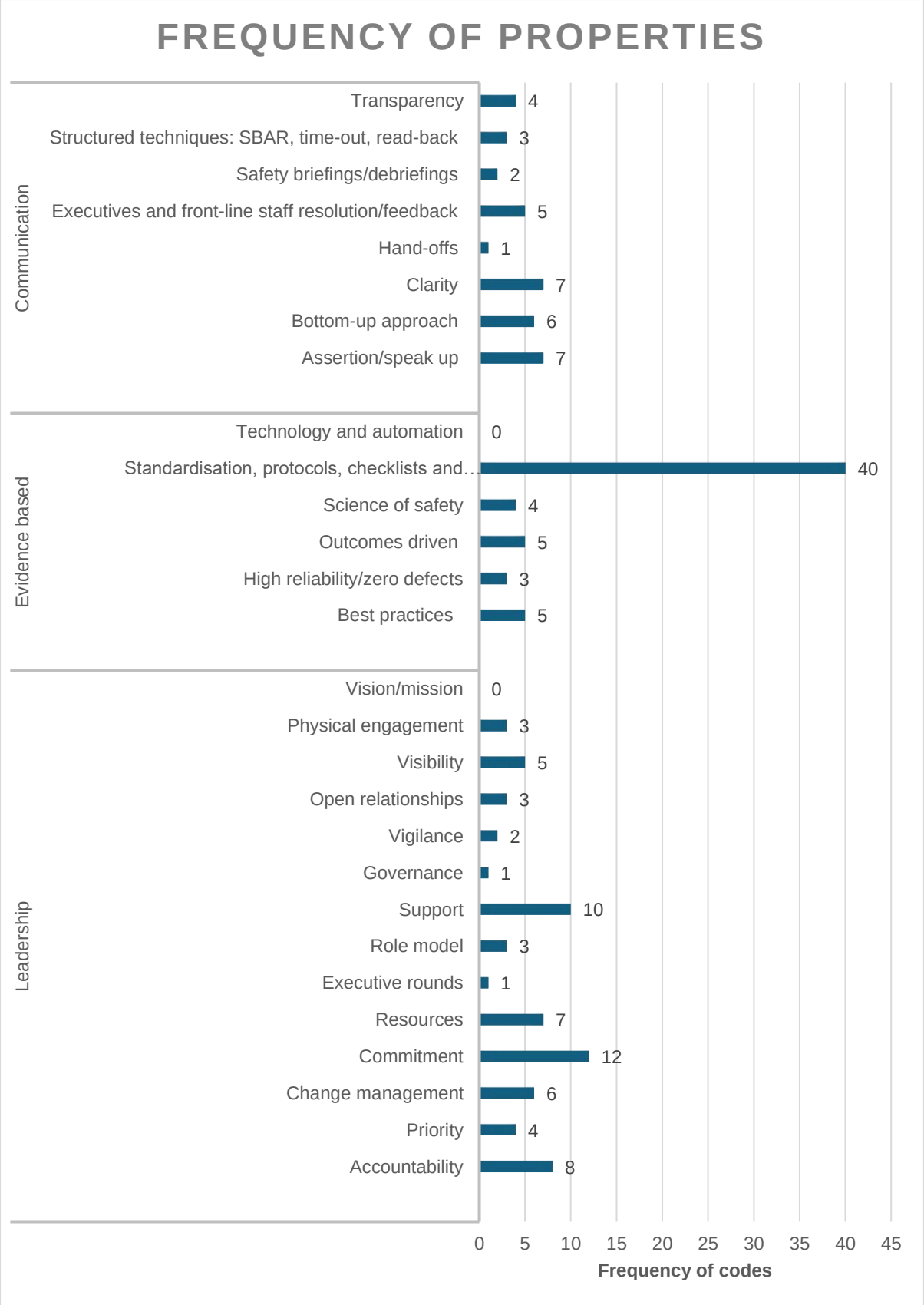


Figure 13 - A histogram depicting the frequency of codes for patient safety related publications.

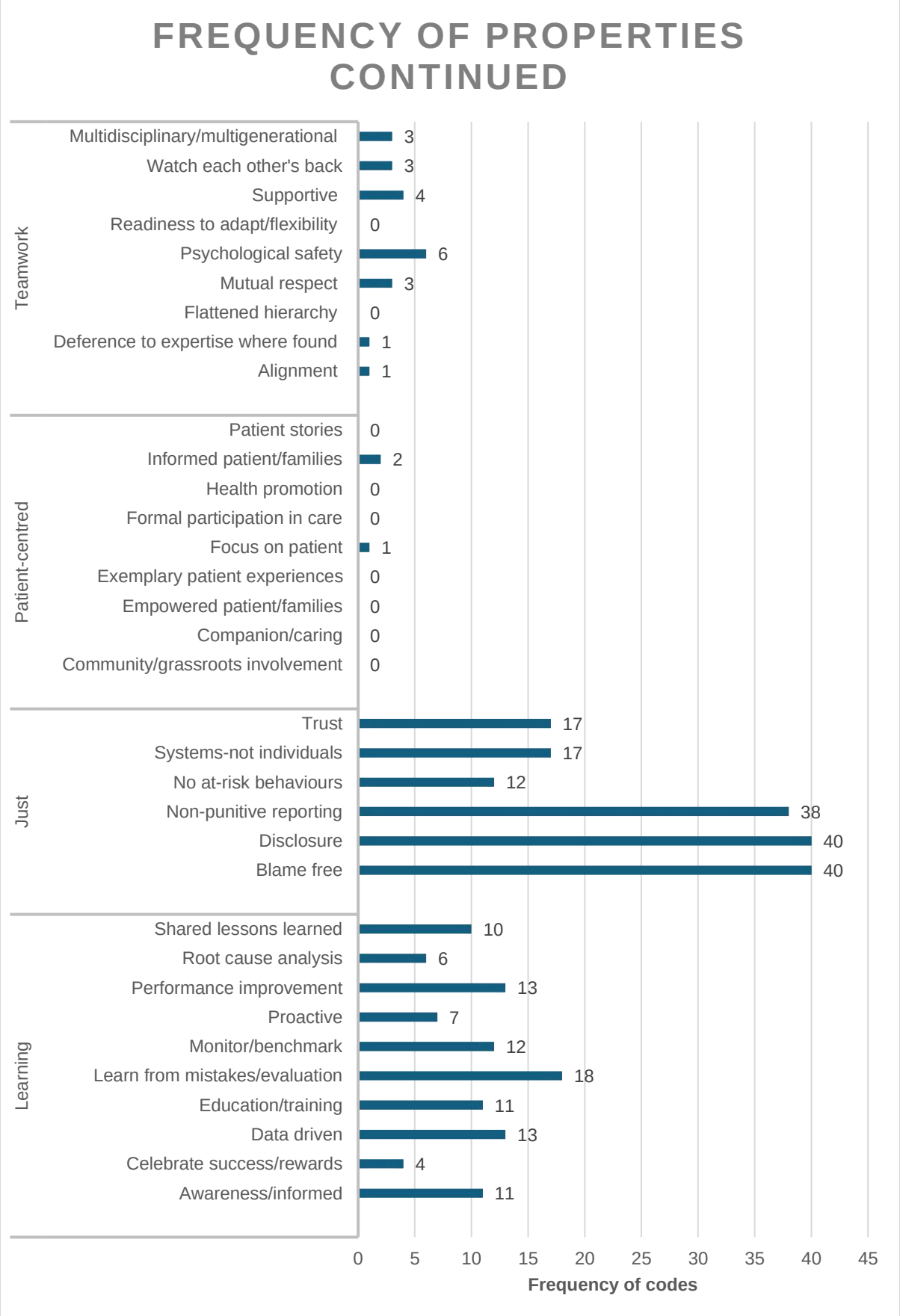


Figure 13 continued - a histogram depicting the frequency of codes for patient safety related publications.

2.434 Frequency of constructs

The frequency of constructs is similar between the domains, with procedures standing out as the most discussed (Figure 14).

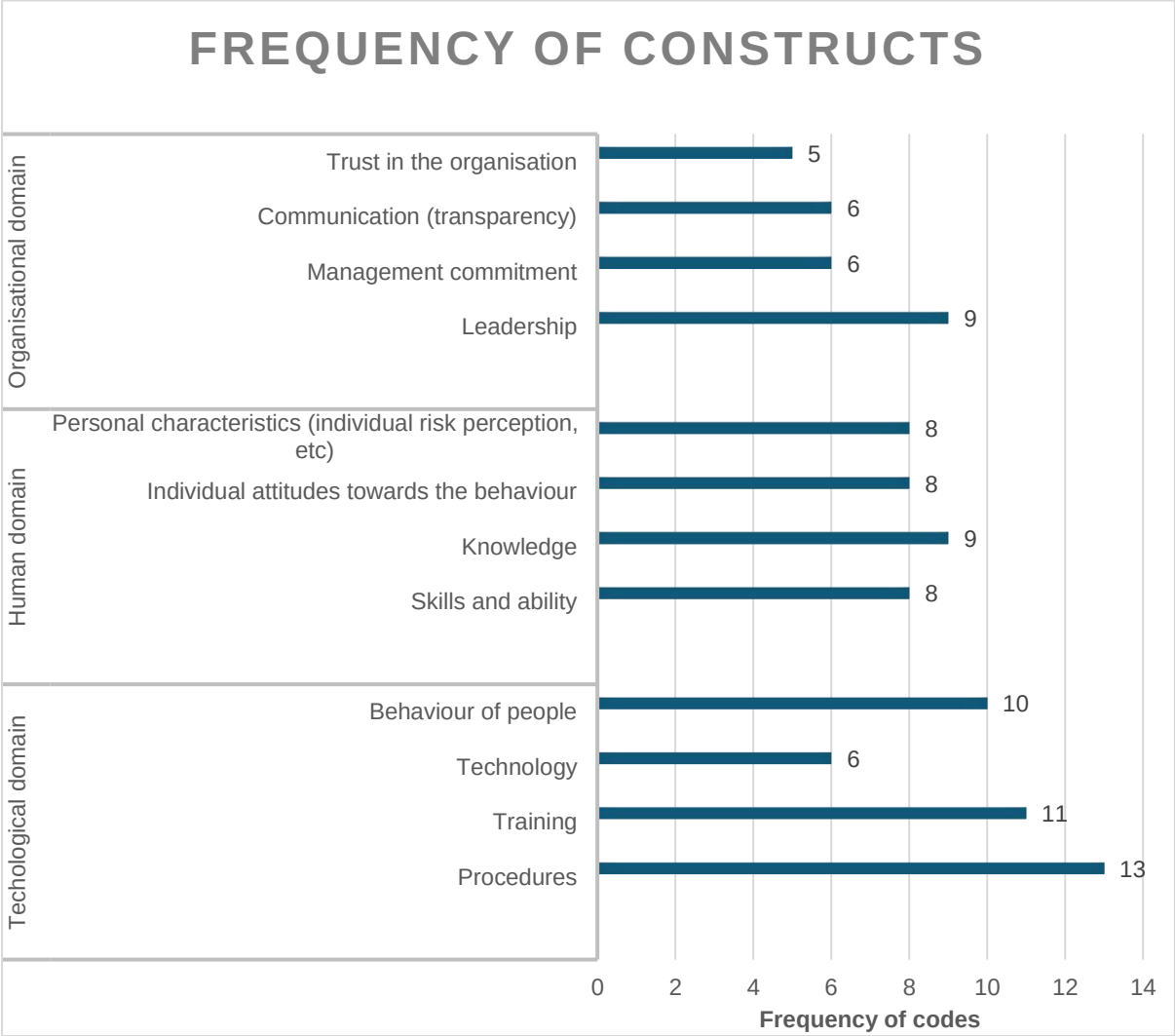


Figure 14 - A histogram depicting the frequency of codes for staff safety related publications.

2.44 Synthesis of results

A number of publications discuss all the domains, and a single publication presents all subcultures (Table 7). However, the mean number of subcultures discussed in each publication is 1.7 and the mean number of domains is 2.25.

Table 7 - Domains and subcultures of safety cultures identified within the publications included in the scoping review.

Author and Year	Patient Safety							Staff Safety		
	Evidence based	Learning	Communication	Just	Patient centred	Teamwork	Leadership	Technological Domain	Human domain	Organisational domain
Case reports										
Pang et al. (2021)	■			■			■			
Low and Wu (2022)	■	■	■	■	■	■	■			
Hillen et al. (2023)			■	■						
Fernández Barrientos et al. (2022)	■									
Benedetti et al. (2017)	■	■		■						
Opinion articles										
Waxman (2020)	■									
Waxman (2022)	■									
Waters (2020)		■								
Waters (2017a)				■			■			
Waters (2017b)				■						
Waine and Brennan (2015)	■	■								
Turner (2022)	■	■					■			
Turner (2021)			■	■		■	■			
Tivers and Adamantos (2019)		■		■						
Tivers (2015)	■			■						
Tivers (2011)	■			■						
Thieman (2011)	■									
Steffey et al. (2023)			■				■			
Schortz et al. (2022)				■						
Rippingale (2020)	■			■						
Read (2019)				■						
Perrin (2017)			■	■		■				
Oxtoby and Mossop (2016a)	■									
Oxtoby and Mossop (2016b)	■									

Author and Year	Patient Safety							Staff Safety		
	Evidence based	Learning	Communication	Just	Patient centred	Teamwork	Leadership	Technological Domain	Human domain	Organisational domain
Oxtoby (2020)		■		■						
Oxtoby (2019a)				■						
Oxtoby (2019b)				■						
Oxtoby (2018a)							■			
Oxtoby (2018b)				■			■			
Oxtoby (2018c)							■			
Murphy (2022)			■	■						
Mossop et al. (2015)			■							
Mosedale and Blackie (2021)				■						
Mosedale (2023)				■						
Mosedale (2020a)	■									
Mosedale (2020b)	■									
Meehan (2019)								■		
McMillan (2014a)				■						
McMillan (2014b)	■		■	■	■					
Mair (2020)	■									
Limb (2021)				■						
Klahn (2014)								■	■	
Jarvis (2018)				■						
Honey (2020)	■									
Hagstad and Hubbert (1977)								■		■
Griffin (2013)								■	■	■
Gasson and Wager (2013)	■									
Frankel (2017)	■									
Hofmeister and Love (2023)				■						
Ebeck (2022)	■									
Daly (2022)	■	■		■						
Copson (1997)								■	■	■
Conner (2021)	■	■								

Author and Year	Patient Safety							Staff Safety		
	Evidence based	Learning	Communication	Just	Patient centred	Teamwork	Leadership	Technological Domain	Human domain	Organisational domain
Clarke (2004)								■	■	■
Clark (2017)				■						
Clapham (2015)	■									
Blackie (2022)				■						
Ballantyne (2018)	■									
Armitage-Chan (2014)	■			■						
Adin et al. (2018)										■
British Animal Rescue and Trauma Care Association (2018)								■		
Posters										
Gibson et al. (2021)				■						
Research articles										
Wallis et al. (2019)				■						
Ward et al. (2019)	■									
Thieman Mankin et al. (2021)	■									
Russell et al. (2022)			■							
Ruch-Gallie et al. (2017)	■				■					
Oxtoby et al. (2017)		■	■	■		■	■			
Oxtoby and Mossop (2019)		■		■						
Oxtoby et al. (2015)				■						
Orjefelt (2021)	■									
Nappier et al. (2017)	■									
Monticelli et al. (2023)								■	■	■
Menoud et al. (2018)	■									
Mellanby and Herrtage (2004)				■						
McMillan and Lehnus (2018)		■		■						
McMillan and Lehnus (2022)	■	■				■	■			
McMillan and Darcy (2016)		■		■						

Author and Year	Patient Safety							Staff Safety		
	Evidence based	Learning	Communication	Just	Patient centred	Teamwork	Leadership	Technological Domain	Human domain	Organisational domain
McLaughlin et al. (2016)	■									
Love et al. (2021)		■	■	■		■	■			
Ling et al. (2021)		■								
Leicester et al. (2023)	■	■								
Launcelott et al. (2019)	■									
Kinnison et al. (2015)			■	■						
Kilbane et al. (2020)	■									
Jensen et al. (2022)								■	■	■
Irwin et al. (2019)								■	■	■
Hofmeister et al. (2014)	■	■	■	■						
Ho et al. (2023)				■			■			
Fowler et al. (2016)								■	■	■
Hill et al. (2023)	■									
Hawker et al. (2021)	■									
Hartnack et al. (2013)		■		■						
Gregorich et al. (2018)									■	
Gibson et al. (2022)			■	■						
Freitas et al. (2021)								■	■	■
Enomoto et al. (2020)	■									
Davidow et al. (2023)	■									
D'Souza et al. (2009)								■		
Cray et al. (2018)	■									
Campbell et al. (2023)							■			
Bergstrom et al. (2016)	■									
Adebowale et al. (2020)								■		
Davidow (2021)				■						
Alexander-Leeder et al. (2022)				■						

2.5 Discussion

2.51 Research protocol

A comprehensive approach was employed in this review to identify and include all relevant publications, utilising broad search terms, inclusive criteria, and a wide range of databases and individual journals. This method maximised the probability of capturing all literature relevant to veterinary safety culture.

2.52 Distribution of evidence sources

The review demonstrated that a significant majority of the work on veterinary safety culture originates from the United Kingdom (UK). However, there are still substantial numbers of articles from the United States of America (USA), Canada, Europe, and one article from Africa, highlighting that safety culture is a global concern.

The chronological distribution showed that an overwhelming majority of the included publications were published in the preceding 5 years. This is an unusual finding as previous peaks in safety culture research have typically followed the publication of significant reports, such as the INSAG-1 report (1992) or *To Err is Human* (Kohn et al., 2000). To the author's knowledge, there has been no landmark publication in the field of safety, nor change in legislation that could be the cause of the recent interest in veterinary safety culture. The increasing focus on veterinary safety culture underscores its growing importance in the field. Although the veterinary profession has been slower to adopt these practices compared to other sectors, there is now significant momentum towards enhancing the safety of both patients and staff.

Small animal practice emerged as the predominant setting for the literature on safety culture, while farm practice was notably underrepresented. This finding was unexpected given the occupational hazards associated with agriculture, which has one of the worst rate of fatal injury to workers, with many of these caused by animals (HSE, 2023b). It had been anticipated that

a greater proportion of the available literature would focus on this area of practice. The emphasis on small animal practice, however, is unsurprising given the multifaceted nature of this area, with large, multidisciplinary animal hospitals regularly performing sophisticated treatments. This complexity underscores the need for a positive safety culture in order to reduce the frequency of harm to both patients and staff as exhibited in medicine (Brilli et al., 2013).

2.53 The evidence base for veterinary safety culture

Checklists feature prominently in veterinary safety culture, exemplified by a plethora of original research, case reports and opinion pieces. This is one of the few areas of veterinary safety culture that has benefited from both strong empirical evidence and opinion pieces supporting and championing their uses in clinical practice. In 2009, The World Health Organisation (WHO) published the Surgical Safety Checklist (SSC) (WHO, 2009). The use of this checklist significantly reduced the occurrence of inpatient complications and the rate of death in non-cardiac surgeries (Haynes et al., 2009) and ultimately led to compulsory adoption by the NHS in 2010. The uptake of checklists and protocols in veterinary medicine, however, has not been as fast. Tivers (2011), advocated for this adoption, highlighting issues like retained swabs that could be mitigated with checklists, this view was also shared by Thieman (2011) . Despite the strong case presented in medicine for their adoption, it was not until 2014, that research into the efficacy of checklists was conducted in veterinary medicine (Hofmeister et al., 2014). Similar to studies in medicine, the use of a bespoke veterinary checklist was found to significantly reduce the occurrence of errors and near misses. Further research, again examining the effectiveness of SSCs has underscored their importance in veterinary safety culture (Bergstrom et al., 2016, McLaughlin et al., 2016, Cray et al., 2018, Ruch-Gallie et al., 2017, Menoud et al., 2018, Ward et al., 2019, Launcelott et al., 2019, Hawker et al., 2021, Orjefelt, 2021, Thieman Mankin et al., 2021).

The application of checklists and protocols is not exclusive to surgical procedures with efficacy demonstrated for non-surgical medical conditions (Enomoto et al., 2020) and improving the

thoroughness of wellness visits (Nappier et al., 2017). Despite this evidence supporting their utility, checklists, protocols, and standardised procedures still face limitations in achieving widespread adoption. The success of checklists in improving safety culture relies on their design and usage in practice (Kilbane et al., 2020, Davidow et al., 2023). Consequently, it is down to the management of individual practices to implement checklists at a local level where internal incidents or audits have highlighted them as a viable method of improving safety (Benedetti et al., 2017, Pang et al., 2021, Low and Wu, 2022). Research has shown that attitudes towards checklists are favourable (Hill et al., 2023), and therefore managers must ensure that they are used correctly and in situations where they are of benefit (Fernández Barrientos et al., 2022).

Whilst checklists have benefited from a substantial quantity of original research and supportive opinion articles, other evidence-based safety culture properties have not received similar focus. There is a notable difference in the quantity of literature across this subculture with no original research published. However, there does exist a single case report (Low and Wu, 2022) which provides anecdotal evidence underscoring the importance of these unexplored areas. Beyond this, only exists opinion pieces which raise the profile of these areas (Turner, 2022, Mosedale, 2020b), but do not provide the empirical evidence needed to back the implementation of these practices.

There was a paucity of literature in the patient centred subculture with only a single research study (Ruch-Gallie et al., 2017) providing only a cursory look at this subculture's role in veterinary safety culture, due to its focus on other aspects. The patient centred subculture encompasses a wide spectrum of practices aimed at involving owners in the decision-making process and ensuring that patient care is prioritised over other stakeholder interests. In all instances where the patient-centred subculture is analysed, the evidence-based subculture is concurrently discussed. Similarly, communication is frequently examined alongside patient-centred in two of the three articles. Although both may seem to have a significant degree of overlap as both subcultures, patient-centred and communication, have properties which focus

on interactions. However, there are distinct differences with the communication subculture focusing on the interactions between staff members, whereas patient-centred comprises communication between staff and owners. Further exploration of the relationship between these subcultures and the development in understanding of a patient-centred approach is needed to understand the role this subculture plays in veterinary safety culture.

Teamwork and communication have emerged from this review as under explored. The associated properties of both sub-cultures are addressed with a relatively uniform frequency across all publications, suggesting a breadth-first approach where multiple properties are discussed collectively, instead of individually. Original research in both subcultures is limited with only Russell et al. (2022) analysing communication and its effects on safety culture directly. Communication in particular, is often discussed as enabler for other subcultures, such as just or evidence-based, instead of a standalone factor. For example, Hofmeister et al. (2014) considers communication, but only in the context of its impact on the effectiveness of a checklist. Again, this is true with Kinnison et al. (2015) who analysed the role of communication in enabling a just culture. This suggests that the current research has not fully explored communication and teamwork as distinct, integral parts of veterinary safety culture.

Although leadership is recognised as crucial in other industries (Glendon and Stanton, 2000, Sammer et al., 2010, Vierendeels et al., 2018), there is no research that considers it as a standalone subculture in veterinary practice. Medicine utilises leadership protocols and interventions, such as the University College Dublin (UCD) ‘Co-Lead’ protocol (Eilish et al., 2017), which have proven effective in promoting safety culture (De Brún et al., 2020). However, only two brief opinion pieces consider leadership as a standalone subculture (Oxtoby, 2018a, Oxtoby, 2018c) Instead, the literature considers leadership as an enabler, frequently appearing alongside just and evidence-based subcultures.

This was unexpected, as leadership, both from clinical and commercial perspectives, is fundamental to veterinary practice. The Royal College of Veterinary Surgeons’ (RCVS) veterinary Graduate Development Program (VetGDP) (RCVS, 2023b) exemplifies this by

using ‘advisors’ to act as role models and provide support, both key properties of the leadership subculture. Therefore, it was anticipated that some literature would consider the impact that roles like the VetGDP advisor could have on a practice’s safety culture, as it is acknowledged that such individuals impact the development of new vets in both positive and negative ways (Armitage-Chan and May, 2018). These influences can shape not only how new vets perceive safety culture but also how they contribute to it, underscoring the importance of leadership in veterinary safety culture.

The learning subculture is predominantly viewed through two distinct lenses. The first perspective aligns learning with quality improvement (QI) which is explored through a single research article (Leicester et al., 2023) and a series of opinion pieces (Waine and Brennan, 2015, Mosedale, 2020b, Mosedale, 2020a, Waters, 2020). These publications discuss its practical application and provide anecdotal evidence on its use. Such coverage in the literature suggests QI is an active part of veterinary safety culture as changes made through QI often reduce avoidable harm to both patients and staff. Despite this, the results of this review indicate a lack of appreciation that QI is only one component of the learning sub-culture.

This perspective views learning as a constituent part of the just subculture, with the prominent property of "learn from mistakes" frequently appearing in publications focused on the just subculture. However, the overlap between these subcultures is not consistent, even among the same authors, leading to inconsistent discrimination in the literature. Some authors regard learning as an integral part of the just subculture rather than a distinct entity (Oxtoby, 2019b, Tivers and Adamantos, 2019). Others consider learning as a consequence of the just subculture (Oxtoby, 2018b, Oxtoby and Mossop, 2019), implying that it is an outcome or effect of the just subculture's principles. This variability in interpretation suggests that a clearer definition of the just and learning subcultures is needed to fully understand their roles in veterinary safety culture.

The just subculture emerges as the most frequently discussed aspect of veterinary safety culture, with publications primarily focusing on error reporting. Whilst disclosure is the most

discussed property, it is important to note that there is no mandatory requirement to report incidents and accidents affecting patients. This fact is enshrined in the RCVS Code of Professional Conduct (RCVS, 2023a), which only advises the reporting of adverse drug events to the Veterinary Medicines Directorate (VMD). This lack of mandatory reporting is particularly significant given the existence of systems for the voluntary reporting of incidents and evidence of demand within the profession, as highlighted by Oxtoby and Mossop (2019). However, there is a noticeable gap in the analysis and evaluation of these systems' effectiveness in reducing the frequency of incidents and accidents. McMillan and Lehnus (2018) emphasise the importance of a systems-based approach, which is one of the few studies examining the effectiveness of this approach in veterinary medicine. This clearly illustrates how an integrated approach, combining a systems-based approach with a reporting system, can positively impact a practice's safety culture. However, the role of the just subculture is still developing; without research demonstrating its effectiveness in all areas of practice, there is little incentive to support the mandatory reporting of incidents.

On the contrary, serious incidents and accidents that affect staff must be reported in line with the Reporting of Injuries, Diseases, and Dangerous Occurrences (2013/1471) Regulations 2013 (RIDDOR 2013), yet despite this legal requirement, there is no mention of RIDDOR in the veterinary literature, barring a singular web article (Lea, 2011). This omittance is particularly interesting, given the inherent risks faced by staff in veterinary practices. The staff element of veterinary safety culture is underexplored, in contrast to patient safety aspects.

Many of these publications consider important topics such as radiation (Gregorich et al., 2018, AF et al., 2021, Freitas et al., 2021, Jensen et al., 2022) or the Health and Safety at Work Act 1974 (Clarke, 2004). The most frequently discussed was procedures and the least discussed was technology, which was surprising considering the recent technological advancements that make veterinary practice safer and more efficient. This imbalance demonstrates the focus of veterinary safety culture is on patient safety, despite the considerable risk that veterinary staff are exposed to.

As in other industries, there are tools to measure safety culture. The Nottingham Veterinary Safety Culture Survey (NVSCS) (Oxtoby et al., 2017) is one such tool, offering a means of assessing a practice's safety culture and facilitating the analysis of interventions. Its effectiveness is underscored by a successful application of a modified version (Love et al., 2021). However, the domains are less comprehensive compared to those detailed by Sammer et al. (2010). While there is some overlap, Sammer et al. (2010) clearer delineation of subcultures offers a more detailed framework. The lack of breakdown leads to ambiguity in understanding and identifying specific practices within these domains, potentially reducing the NVSCS' effectiveness. These limitations are why this review utilised the models of safety culture presented by Sammer et al. (2010) and Vierendeels et al. (2018), rather than the domains of Oxtoby et al. (2017). Despite these issues, the NVSCS remains valuable for further use in practice. However, the absence of publications that promote its use or provide anecdotal evidence indicates a limited awareness within the profession on how to effectively utilise this important tool.

2.6 Limitations

The scoping review was limited to publications in English, which may have resulted in the exclusion of relevant studies published in other languages. This may explain the predominance of studies from English-speaking countries in the review findings. Moreover, the scoping review may have inadvertently excluded relevant studies that did not contain the exact search terms or whose title/abstract did not accurately reflect their content. Furthermore, the use of pre-existing models of safety culture that were not specifically tailored to the veterinary context means that the gaps highlighted in the review may not accurately reflect the areas of safety culture that require further understanding.

Not all stages of the review were completed by both TC and KW which could have resulted in errors within the data charting process. However, this issue was mitigated by KW conducting spot checks throughout the process to ensure and maintain accuracy and reliability. Future reviews should look to incorporate multiple researchers at all stages of the scoping review to ensure consistency in screening and charting.

A further search of Scopus (Elsevier, 2023) was conducted in May 2024 using the search term in Table 4, identified a total of 741 publications prior to screening. This compares to the 648 identified in September 2023, marking an increase of 93 publications. Whilst not all of these articles will meet the inclusion and exclusion criteria, this increase highlights the fact that scoping reviews become outdated as soon as they are conducted, due to the continuous publication of new research. This underscores the importance of tools such as Scopus' search alerts (Elsevier, 2023) and novel AI-based technologies that can not only search but also update records to ensure that search results remain current.

2.7 Conclusion and recommendations

Veterinary safety culture is in its infancy, with significant knowledge gaps in the understanding of various subcultures/domains, and particularly, the crucial area of staff safety. Although notable progress in the evidence-based and just subcultures has been made, challenges remain. The lack of standardisation across veterinary practices stemming from differences in: species treated, ownership and geography poses a significant hurdle to the advancement of safety culture, as a one-size-fits-all approach is unlikely to succeed. Consequently, there is an absence of research that examines many key areas of safety culture, necessitating further research to explore the reasons for these gaps.

Key recommendations include the following:

- Defining and modelling safety culture – In-depth research that scrutinises the role of the subcultures/domains in veterinary safety culture and their interconnectedness. This exploration should reveal the impact that these have on veterinary safety culture, helping create a model and definition for the profession.
- A focus on staff – Detailed research which investigates methods of improving the staff aspect of veterinary safety culture.
- Exploration of practice settings – Research in veterinary safety culture must be expanded in order to encompass other areas of the profession, notably farm and equine. This research should highlight the challenges and opportunities for implementing a positive safety culture in these settings.
- Understanding the professions' perspective – Research into the professions current understanding of safety culture. This exploration should underline current perceptions, knowledge gaps and areas of confusion regarding safety culture. Results from this can guide the publication of opinion pieces to help improve awareness of the importance of safety culture.

Chapter 3: Veterinary safety culture - a qualitative analysis

3.1 Introduction

The scoping review evidences a lack of understanding on what veterinary safety culture comprises. There are no clear definitions, and the factors presented by the NVSCS (Oxtoby et al., 2017) do little to clarify the concept of safety culture for veterinary staff. Several measures and components of safety culture were identified; however, these were not always branded as safety culture when they indeed are. As a result, a qualitative study will be conducted to analyse the professions understanding and perceptions of safety culture. In order to facilitate this exploration, a modified version of Turner et al. (1989) definition of safety culture will be used:

> *The set of beliefs, norms, attitudes, roles, and social and technical practices that are concerned with minimising the exposure of employees, managers, customers, members of the public and patients to conditions considered dangerous or injurious.*

Utilising this definition and the model presented by Sammer et al. (2010) as a handrail, this study will pose the following research question:

What are the current perceptions that veterinary staff and students have towards safety culture?

3.2 Aims and objectives

In order to answer the research question, the study will be broken down into the following aim and objectives.

Aim:

- To explore veterinary staff's and students' experiences of safety culture.

Objectives:

1. Explore how veterinary staff define and comprehend safety culture.
2. Explore the opinions of veterinary staff on safety culture.
3. Explore whether barriers to safety culture exist.
4. Assess how veterinary students understand and interpret safety culture, and their perceived role with in it.

3.3 Methodology and methods

3.31 Research design

A mixed qualitative approach was utilised due to the need for rich contextual data, thereby offering valuable insights and a deeper understanding of veterinary safety culture that would not be available with a quantitative approach.

As this study aims to understand how individuals interpret their experiences of safety culture, interviews were selected as the method for data collection. Interviews and focus groups were selected over other means of qualitative data collection as participants have a professional stake in veterinary safety culture and therefore are likely to generate the rich and textual data needed (Braun and Clarke, 2013). This focus on the lived experience, individual perceptions and understanding is important to answering the research question. Furthermore, the one to one nature of interviews may better facilitate discussion on more ‘taboo’ areas such as mistakes, communication and leadership which can be inhibited by differing opinions in group settings (Barbour, 2018). However, given their non-practice setting and freedom from career-related influences, veterinary students were uniquely suited for focus groups.

3.311 Researcher reflexivity statement

The primary researcher and interviewer for this study was Thomas Conway BVetMedSci(Hons), a male MRes and a student at the University of Nottingham SVMS at the time of the study. The interviewer’s background in veterinary science provided him with the

necessary knowledge, understanding, and experience to conduct the interviews and facilitate the focus group, The interviewer had completed eight weeks of clinical extramural studies (CEMS) demonstrating that he possessed a basic understanding of veterinary practice. No prior relationships were established with the participants before the study, and post-study, participants were not approached for their comments or feedback on the research findings.

The researcher acknowledges that his background and personal views may influence his perspectives and interpretations of the data. However, a reflexive approach was utilised throughout the study, following the approach by Braun and Clarke (2019) - reflexive thematic analysis.

3.32 Participant selection

Veterinary surgeons, RVNs, and veterinary students in their 4th and 5th year of study were selected as groups that could take part in this study. SVNs and veterinary students in their 1st, or 2ndyear were not selected as these groups may lack the clinical education and exposure needed to understand elements of safety culture. Convenience and purposive sampling were used in tandem to select individuals within different groups across the profession. E-mails were used to contact veterinary surgeons, RVNs and veterinary students at SVMS offering to take part. Whilst no financial incentives were provided, veterinary surgeons and RVNs were reminded that participating in an interview could count towards their RCVS Continuing Professional Development (CPD) requirement. Veterinary students were offered food and beverages whilst in the focus groups.

3.33 Ethical considerations

After registering, participants received a participant information sheet and a consent form (Appendix 4) for review, which they returned digitally signed using Adobe Reader (Adobe, 2024) or with a wet signature. Before the focus group or interview, participants were given the opportunity to ask questions to both the primary and secondary researcher. At the start of each focus group/interview, participants were reminded of their rights, including the right to withdraw

from the study for any reason and for at any time up until the designated point of withdrawal (05 Mar 24).

The study received approval from the University of Nottingham SVMS ethics committee (Approval number: 3894 230726). To ensure participant privacy, interviews and focus groups exclusively recorded audio, with all transcripts anonymised. Furthermore, all data collected was stored and handled in accordance with the University of Nottingham's data protection policy (University of Nottingham, 2024b) and records management policy (University of Nottingham, 2024d).

3.34 Data collection

Semi-structured interviews and focus groups were conducted using an interview and focus group guide (Appendix 5) which was developed in line with the recommendations by Braun and Clarke (2013) and piloted on a veterinary student to ensure clarity. Questions initially asked participants for their existing knowledge on a particular area of safety culture, before presenting them with definitions and models depicted both on paper and, additionally for focus groups, on a PowerPoint (Microsoft, 2024a). Further open-ended questions asked participants for their thoughts on the model presented by Sammer et al. (2010) and finally after this, open-ended questions were asked about participant's experiences.

All focus groups were in-person whilst interviews were a mixture of in person and online with only the primary researcher and participants present. Face to face sessions were recorded using Word (Microsoft, 2024c) whilst online sessions were recorded using Teams (Microsoft, 2024b). Transcriptions generated by both programmes were fully checked and discrepancies were rectified by the primary researcher. Data collection was continued until 14 participants were surveyed.

3.35 Data analysis

Analysis of the interview and focus groups was completed in NVivo (QSR International, 2024) following the 6 stage reflexive thematic analysis process as outlined by Braun and Clarke (2019):

1. Familiarisation with the data.
2. Coding the data.
3. Generating initial themes.
4. Reviewing and developing themes.
5. Refining, defining, and naming themes.
6. Producing the report.

3.351 Data familiarisation

An active reading strategy (University of Nottingham, 2024c) was adopted by the primary researcher to ensure thorough and detailed familiarisation with the transcripts. The memos and annotations feature in NVivo (QSR International, 2024) were utilised in tandem with an audio diary. The use of annotations and memos allowed for the immediate linking of reflections to specific data segments, ensuring both a dynamic and interactive review process. The audio diary served as a complementary tool, enabling the capture of reflective insights that otherwise would have been difficult to document through written means.

Through this approach, important points, initial reflections, analytical thoughts, and emerging patterns were recorded. This facilitated a richer familiarisation with the data and ensured a reflexive approach was adopted for the subsequent coding and thematic analysis.

3.352 Coding and theme development

A combination of semantic and latent coding, as described by Braun and Clarke (2013), was utilised. Semantic coding summarised the explicit content, while latent coding uncovered the deeper, inferred meanings within the data. This combination of coding styles enabled a full and holistic analysis of the data.

During the coding process, initial codes were refined, with similar codes consolidated while preserving their distinct nuances. A collaborative coding style was adopted with the secondary researcher proving assurance by reviewing codes and challenging the primary researcher on the naming of codes. Any differences were resolved through discussion, resulting in the creation of a final code book (Appendix 6 - Final code book).

From the refined codes, initial themes were identified, grouping codes based on their underlying concepts and the data's emerging narrative. These themes were refined through discussion between the primary and secondary researchers ensuring robust final themes were produced. The relationship between themes is explored through diagrams, outlining how themes are interlinked and dependent on each other. Throughout this process, an audio diary was maintained ensuring reflexivity via acknowledging the primary researcher's role in the interpretation of the data.

3.4 Results

3.41 Interviews

A total of 14 interviews were performed both online and in person during the period of January to February 2024. The distribution of interviewees by profession and area of practice is depicted in Figure 15. The duration of interviews was between 15 minutes and 1 hour and 10 minutes. All interviewees were staff members at the University of Nottingham SVMS or worked in an associated clinical partner practice. Detailed demographic data is not shown to maintain participant privacy. For the purposes of this study, a specialist vet was defined as any vet who had obtained a recognised diploma.

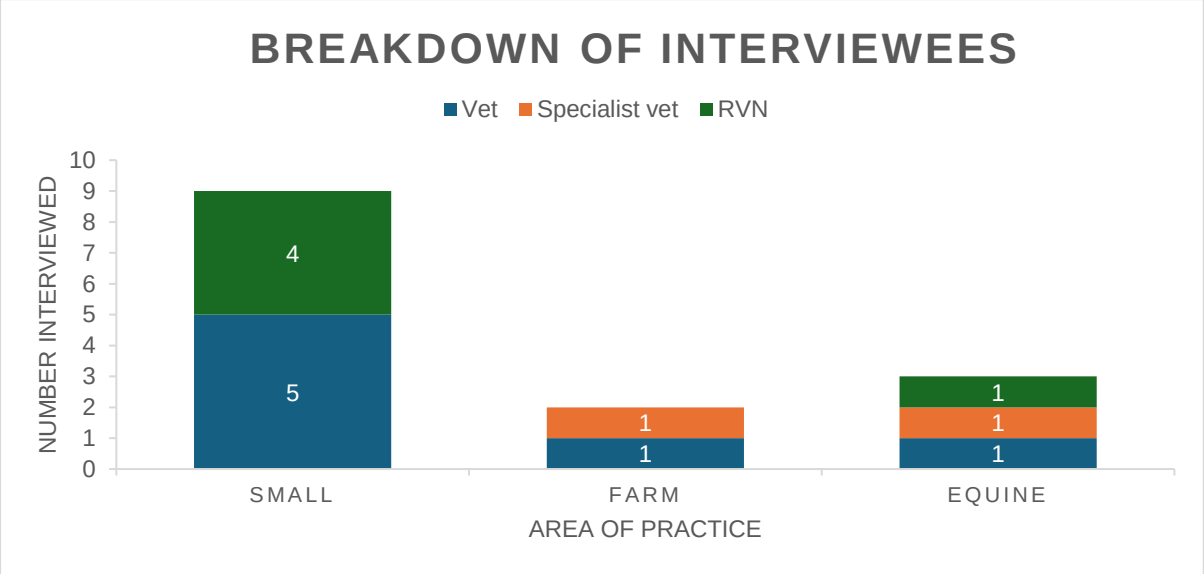


Figure 15 - A histogram showing the number of interviewees by profession and area of practice.

3.42 Focus group

A single in-person focus group was conducted in January 2024 with three, fourth-year veterinary students at the University of Nottingham SVMS. This was 50 minutes in duration. Of the participants, there was two female, and one male participant. All had spent a similar amount of time on CEMS, having completed placement in the preceding holiday.

3.43 Theme development

Initially, 7 themes were developed:

1. Risk
2. Understanding.
3. Education.
4. Infancy.
5. Individualised.
6. Control.
7. Business aspects.

The relationship between these themes is explored by Figure 16.

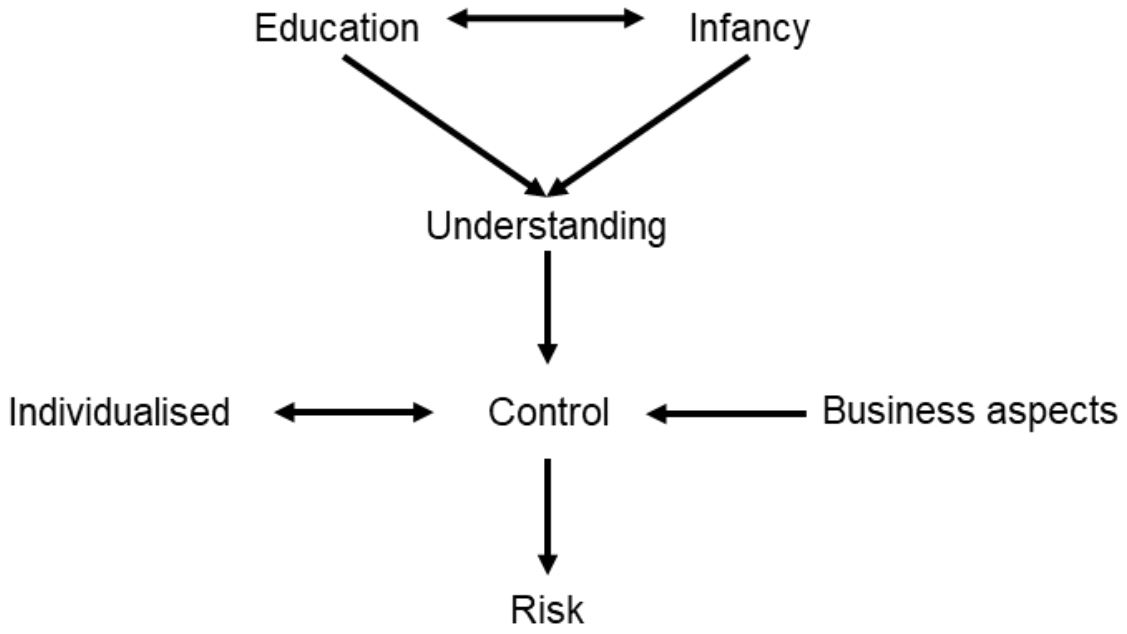


Figure 16 - The initial thematic diagram.
Key: Arrows signal a relationship between themes, arrow direction signals the direction of influence, double arrows signify that themes are interdependent.

Further refinement of these themes through discussion resulted in 4 final themes:

1. Understanding.
2. Operational aspects.
3. Control.

4. Risk.

Although these themes are distinct, they are interrelated, and a degree of overlap exists between them. This relationship between the themes is explored in Figure 17.

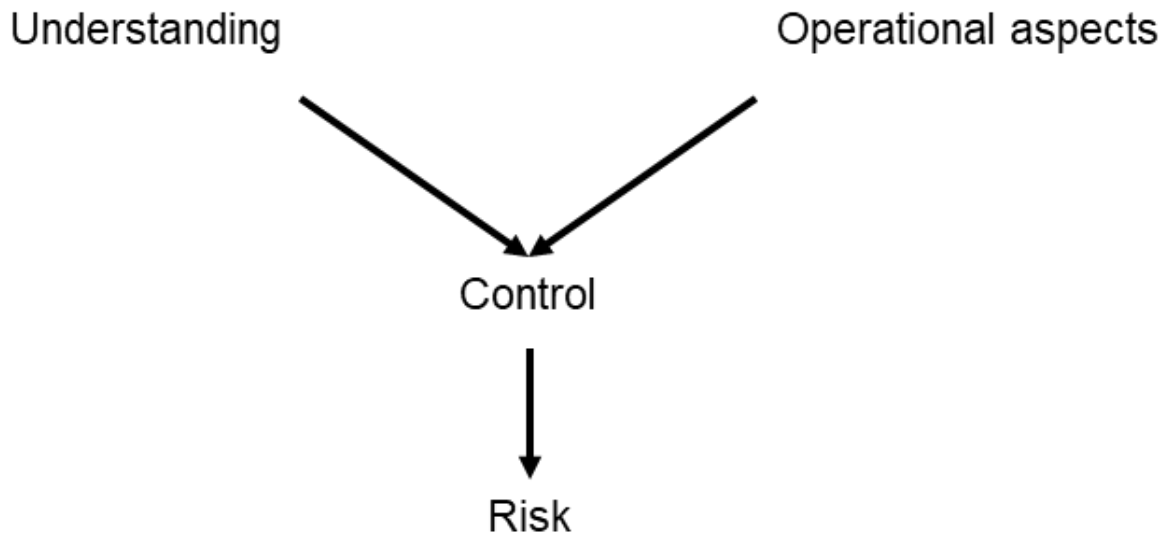


Figure 17 - The final thematic diagram depicting the factors that influence veterinary staff's experience of safety culture.
Key: Arrows signal a relationship between themes; arrow direction signals the direction of influence.

3.431 Theme 1 - understanding

The theme of understanding accounted for the greatest number of codes. This theme encompasses the way in which veterinary staff interpret, comprehend, and relate to safety culture. Within this theme, codes were predominantly negative, with veterinary staff commonly remarking on what was lacking rather than what was present.

Lack of awareness on what safety culture comprises

The study showed that many participants did not fully understand what safety culture means or how important it is in their work. However, several participants acknowledged having only a cursory familiarity with the term safety culture.

'It (safety culture) is one of those terms that you hear in passing, but never, really like listen to.' (Focus group)

A few participants recognised elements associated with safety culture, such as the implementation of checklists or fostering a no-blame culture. However, they had not viewed these practices as constituents of safety culture.

'I certainly don't think it's (safety culture)a sort of definition and phrase that's used regularly to describe all of the things.' (Interview 5)

Lack of evidence supporting and informing individuals

Participants expressed concerns about the insufficient evidence base supporting safety culture initiatives, indicating a barrier to effectively implementing these measures within veterinary practices.

'I think with the evidence-based thing, that's probably something where we could massively improve. That's not done particularly well.' (Interview 13)

'Evidence based, massively variable. Depends on who you speak to. As a profession, do we do it relatively well? Well, I mean. We do it better than electricians and plumbers.' (Interview 9)

This was viewed as an important factor as vets and RVNs highlighted how evidence informs their decisions when in practice.

'I like the evidence based. That's my training. I like to know that there's. You know, there's the evidence behind whatever we want to implement.'
(Interview 6)

Importance of 'just' subculture not recognised

Participants noted how reflection, and improvement on errors was not regularly performed in their place of work. The 'just' subculture in particular was viewed as requiring improvement.

> *'That just probably has room for improvement. Let's put it like that.' (Interview 12)*

> *'I guess the 'just' bit. If that's where we're thinking kind of blame. Isn't done very well in veterinary practice. We don't deal with criticism, in my personal opinion, very well when things go wrong.'* (Interview 4)

> *'If there's one thing that we do badly, it's reflection 100%.' (Interview 9)*

Some participants viewed the 'just' subculture negatively, comparing it to tale telling.

> *'Smelling alcohol and your colleague's breath, you don't wanna…stitch them up.'* (Focus group)

Blame environment exists

The personal experiences of participants highlighted that a blame environment exists. Some participants discussed how they believed that a blame environment was the central point of failure for veterinary safety culture.

> *'I think that is the main problem is that people feel like there is a blame culture and I think that makes everything else fail.'* (Interview 11)

The ease of identifying those who have reported incidents and accidents was also considered as a barrier to a culture of safety.

> *'Is that if you do report things, it's often pretty obvious who has reported it…And there's a real danger for Chinese whispers to come and then actually, what someone has reported, if it is reported, one; it's known who's reported it. And two;*

it might not be actually the person that was there. It might be third hand by the time it gets reported.' (Interview 12)

View that safety culture is only health and safety

A prevalent misconception was that safety culture simply comprised health and safety, and therefore did not extend beyond the legal requirement. This view often meant that safety culture was viewed as less important or trivial.

'I always thought safety culture was more, making sure you know where the fire exits are. Do you know what I mean?' (Focus group 1)

'I think it (safety culture) means kind of trying to be more health and safety conscious. Making sure that people prioritise health and safety rather than just thinking; Ohh stuff it, I'll just get on with it.' (Interview 6)

Cynical views of safety culture

It was evident that safety culture was not viewed positively, instead, participants saw safety culture as a gimmick or a term with little meaning. In both cases, safety culture measures were not viewed as able to have a positive impact on a practice.

'*But my concern is that a lot of the times it's, it's a tick box exercise.'* (Interview 2)

'*The rest of it's a bit corporately speak. Management speak.'* (Interview 6)

Attitudes of 'just getting on with it'

The view that veterinary staff should 'just get on with it' was common and often believed when there was a personal safety risk. Veterinary staff often described putting themselves at risk of injury in order to complete the task.

'We've often had this culture of you just get on with it.' (Interview 6)

'Yeah, it's just so difficult really. And as a vet, I think in like in equine practice you're so focused on needing to get the job done.' (Interview 8)

Safety culture seen as a waste of time

Veterinary staff perceived time constraints as a significant barrier to the implementation of safety culture measures. Participants did not view the potential time savings that safety culture measures may have (through the reduction of mistakes), instead focussing on the negatives.

> *'I think when the reason that people neglect safety culture is either from laziness or because they want to be efficient.'* (Focus group)

> *'I'm sure a checklist definitely has its place. I just think I would struggle with the time constraints and everything else.'* (Interview 6)

> *'I think that other barriers are, as I said, sort of actually time constraints.'* (Interview 13)

Comments were made on the ability to convince people on safety cultures importance due to this negative perception.

> *'It can be quite difficult to make people get on board with something that they feel is perhaps a waste of time.'* (Interview 11)

Veterinary safety culture seen as less developed compared to others

Veterinary safety culture was often compared and contrasted to other industries such as medicine and aviation but was not viewed as developed as these. Participants gave examples of safety culture practices completed in these industries, that would appear almost comical in veterinary practices.

> *'I would think maybe we're behind human healthcare'* (Interview 7)

> *'I go to or have been to a hospital and every time you move rooms or wards, or you go to a different station in the in the hospital, somebody will pick it (your notes) up and they always ask what's your name, date of birth and the first line of your address. We don't tend to do that.'* (Interview 4)

The need for external advice and guidance on safety culture was also discussed as a method

for improving veterinary safety culture.

> *'I think bringing in experts in safety culture into our industry…from an RCVS level and…I don't think there are people that aren't vets who have, because these people exist like my husband is…now a GP practice manager and there are people that specialise in safety culture and how to manage it and I think…that kind of industry wide action, rather than individual practice action, would be beneficial.'* (Interview 5)

Buy in and the importance of bringing people along

It was noted that enhancing veterinary safety culture crucially depends on securing buy-in and engagement. Participants discussed the need to focus on explaining the rationale behind actions instead of relying solely on direct enforcement

> *'Like, say it's quite hard with getting people on board with doing things like that that they don't see as a benefit*.' (Interview 11)

> *'So, I think whatever you do. In order to create a safety culture. It's got to be very clear what that is to absolutely everyone and they've got to buy into it and be part of the team. Otherwise, it's destined to fail.'* (Interview 12)

Buy in was considered a notable barrier to implementing safety culture measures

> *'It's convincing people in the workplace about the validity of it, I think that's the problem… your biggest problem with safety culture is the buy in of the individuals and people in practice.'* (Interview 9)

Limited exposure to safety culture whilst at vet school

Education, and the role it plays was seen as a barrier to the comprehension of safety culture by veterinary students.

‘*That I've learned a lot about safety culture in this focus group and that maybe it should be taught in some sort of professional component of vet school.’*
(Focus group)

Safety culture is a difficult concept to apply

Vet students expressed difficulty in comprehending safety culture, citing limited clinical exposure as a reason for this.

‘It's kind of hard to understand when we're not in that environment (clinical practice).’ (Focus group)

Recognition that teamwork is important

Whilst the majority of codes had negative connotations, there were those that focused on more positive aspects of veterinary safety culture. Teamwork was viewed by many participants as the cornerstone of veterinary safety culture, and an area that, on the whole, is done well.

‘I think we are an amazing team even when you're not in practice.’ (Interview 1)

‘I think the first thing I'm really hot on is that it is teamwork.’ (Interview 12)

‘The most important thing is a team.’ (Interview 2)

‘Teamwork, probably one of the bits we do best as a profession, especially within the practice nucleus’ (Interview 9)

However, the importance of the team was also recognised as an area for failure.

‘The teamwork stuff, is where we focus a lot of our efforts and also have the greatest capacity to get it wrong, really, in terms of how we actually do develop people, how we take people on, how we support them, how we have each other's back, how we demonstrate mutual respect, all of those bits I would say is where we focus most of our efforts on making a safe workplace. And yeah, I've seen most harm caused there as well.’ (Interview 14)

Just recognised as important

Similarly to teamwork, the just subculture was viewed as playing a key role in veterinary safety culture. Participants described how this area frequently serves as the starting point for improvements in safety culture.

> ‘I think probably the just (sub)culture is the main starting point’ (Interview 14)

Veterinary Defence Society (VDS) associated with regulatory body, not an insurance company

There was the misconception that the VDS was a regulatory body instead of a mutual insurance provider. This had a negative effect on whether participants would utilise the VDS’ error reporting tool *VetSafe* (VDS, 2024).

> ‘If someone told me or you could report it via something with the VDS, I'd kind of feel like it had to be a really big thing in order to involve something like that, you know, patient safety being completely eroded, someone being put at risk of, you know, really serious injury as opposed to a better method for making sure that we didn't leave, you know, capped needles close to the washing machine or something like that. Which, you know that, to me would feel like something that wasn't big enough to sort of go down that route.’ (Interview 12)

3.432 Theme 2 – operational aspects

The theme of operational aspects illustrates how factors influence both the feasibility and practicality of safety culture measures. These factors were often seen as external and out of the control of the veterinary staff but nonetheless, had profound impact on the way in which staff practise within their respective roles. Furthermore, as with the theme of understanding, codes were predominantly negative, focusing on how these inhibited safety culture as opposed to aspects that aided in the creation of a safety culture.

Safety culture measures adversely impact the bottom line

It was a common view that safety culture measures were not implemented due to the financial cost associated with them. However, participants did believe that there were no excuses for not implementing zero cost safety culture measures such as checklists.

> *'I mean, there are things that actually, like checklists. I mean, that's free. There should be no excuse. But you know, maybe some of the health and safety falls a bit short because they haven't got the money to send people off to do the courses.'* (Interview 1)

The idea of a trade-off between having safety culture measures and making money was discussed. It is perceived that safety culture must come at significant cost to the business.

> *'I think there's always got to be a compromise. I think nothing in the world, you can't have 100% of everything, and you might have to compromise one thing while you better something else. I'm not saying to the detriment of staff or patients, but something you might have something really simple like if you need some sort of new instruments, you might have to say to compromise, we have to wait six months, or you know you can go on training CPD in six months.'* (Interview 10)

> *'There's always a balance and a payoff between actually, what practises can afford in terms of time and resource and what is required.'* (Interview 7)

This was compounded by the view that those in leadership were simply focused on the financial state of the veterinary business and not that of culture. Again, this was discussed in a negative context.

> *'Leadership is focused on finance and revenue rather than on practice culture, be that sort of positive working environment or a safety culture.'* (Interview 7)

The belief that risky behaviour promotes financial gains was discussed, with participants believing that a practice with a robust safety culture will be less profitable due to a reduced risk appetite.

> *'So, a safety critical should promote better outcomes, less risk, but it will not be as financially lucrative that that's the that's the thing you have to accept. If you go for a safety critical approach, you will not be as financially lucrative because it encourages you to not to cut corners and it does not encourage you to be risky in terms of your behaviour. Financially lucrative usually comes from more risky behaviour…So, when we think about the business side of it, that's probably one of your biggest obstacles to having a safety culture is that that it's a private industry and therefore there's the financial incentive as well.'* (Interview 9)

Practice facilities impact safety culture

Similarly to the financial aspects of safety culture measures, the availability and serviceability of facilities was viewed as a barrier. Again, these were negatively discussed, with participants focused on how a lack of facilities made safety culture measures difficult to implement or led to behaviour that puts patients and staff at risk.

> *'Different facilities available to you and again and that and I'm not saying it's right or it's wrong because I do think there are times where we go, oh, we haven't got the facilities stuff it I'm going to do it. And that isn't the right attitude.'* (Interview 6)

The disparity between hospital facilities and those available to ambulatory vets was also highlighted. Lone working was consistently described as a barrier to several safety culture measures.

> *'I am mainly based in the hospital. Where I do have much more control over some of those, you know, those aspects. Where you can take the client away from the situation, where you can call on people that can help you provide adequate restraint and where you've got good lighting. And even when you can say, well, actually I just need to walk away from this from 10 minutes. We need to regroup, reassess the situation and then tackle it again. That's really hard when you're by yourself working, working alone…And I think that's the thing that makes a big difference to me is in a hospital, I can always go and find professional, skilled help and I think you can do that in a small hospital. But that's really hard when you're when you, when you're working by yourself.'* (Interview 12)

Staffing levels impact safety culture

Staffing levels were viewed reliably as having a negative impact on a practice's safety culture, regardless of this was because of the need for locum staff, or where there were unfilled absences.

> *'Lack of staff, lack of permanent staff and having locums in that don't know people's safety culture or don't care because they're not there all the time.'* (Interview 10)

The absence of a positive safety culture was also discussed as a reason for poor staff retention.

> *'I do think it's important when you look at the current state of the profession and the problems with workforce and attrition. Actually, if we could create a culture where mistakes were minimised and people felt more sort of supported, then maybe that wouldn't be such a problem.'* (Interview 7)

Patient safety is important due to bottom line

Participants explained that patient safety is prioritised over staff safety as consultations and treatments contribute positively to a practice's bottom line.

> *'Patient safety over staff safety.'* (Interview 12)

> *'So, safety for staff comes last and I think safety for the patients is prioritised because of revenue.'* (Interview 7)

Some participants went as far to rationalise dangerous situations that they have been placed in for the benefit of the patient.

> *'I would say in some practices it is hugely patient-centred, almost to the point at which I'm going, we are unnecessarily putting staff at risk in these situations because we're so focused on getting the job done and the treatment done for the patient that we're forgetting about our own safety or people are forgetting about others' safety.'* (Interview 4)

> *'And so, there's the problem, isn't it? It's the sick patient. Resolve that. Sometimes at the expense of the humans working around the patient'*
> (Interview 14)

3.433 Theme 3 - control

The theme of control comprised issues mostly associated with the interplay between the executability and enforceability of safety culture measures and the reliance on individuals. Participants commented on how the individualised nature of safety culture, whether that be personal attitudes/beliefs or the physical reliance on others adversely impacted veterinary safety culture. Clearly, the less uniformity and greater individual aspect makes control more challenging. Codes related to control are not positive, and as before, often describe the absence, rather than presence of factors.

Cultural background impacts views on safety culture and presents challenges

Individual cultural backgrounds were seen as having a negative impact on safety culture, specifically with regards to how this informs how individuals interact with others.

> *'Communication…That can be interesting, especially with certain cultural circumstances. They can be people who are being assertive can be misconstrued as somebody who is rude. Or too challenging.'* (Interview 2)

Nationality and place of education was discussed as having a similar impact on individual attitudes and beliefs.

> *'So, most people in the higher hierarchical positions speaking derogatory to people in lower, hierarchical positions in my experience have not trained in the UK… there definitely seems to be a culture coming from…America. Not Canada but, America and Europe.'* (Interview 9)

Reliant on individuals

A practice's safety culture was seen as reliant on the individuals that work there.

> *'But it's (safety culture) only as good as the people doing it.'* (Interview 1)

'So yeah, it's (safety culture) very much hit and miss. I think it depends on the person.' (Interview 3)

It was acknowledged by participants that even a single individual has the ability to enact change, although this was phrased in a negative context.

'…just always boils down to that one individual.' (Focus group)

Participants demonstrated that even where safety culture measures were established, individuals still must choose whether to follow these or not.

'I'm the first to admit that I probably don't wear my hard hat as often as I should.' (Interview 12)

The diversity in perspectives on safety across various species was recognised, reflecting variations in practice types and species treated.

'I think there are perhaps slightly different attitudes in different species, in different types of practice, possibly in different regions. I think there's very different attitudes towards safety.' (Interview 13)

Limited influence over the environment when visiting farms and yards

Farm and equine practitioners noted how their working environments are uncontrollable and unknown. There were several variables highlighted that impacted not only the safety of the practitioner, but also that of the animal.

'If the horse is stuck in a fence, then you know you've got to go to that particular patient.' (Interview 12)

The disparity between large animal and small animal practice was highlighted, specifically with regards to the ease of implementing change.

'That the vast majority of the time, despite being in charge of when you walk on farm as a vet. You have very little control over, and you just have to adapt and

react to what happens. It's not like a small animal practice where if you want to change the setup of the kennels, you can.' (Interview 6)

The individual nature of farms, that is, how each farm has different set ups and operating systems was also discussed as a potential barrier to safety culture measures.

'You could try and standardise it between your farms where possible, or at least you standardise it for that routine, so you have the same person helping you and you do it the same way each time. But we're always gonna have that cause each farm has a different handling setup.' (Interview 6)

Leadership needed to drive safety culture

The role of leaders and managers was seen as crucial in shaping and directing a practice's safety culture. The way in which leaders see and act on positive challenge was noted as a factor affecting a practice's safety culture.

'It very much depends who is your leader. What's the leadership style, what type of people you work with, and how confident they are in themselves? And I think a lot of people who are in the leadership positions are not confident. They will see any sort of speaking up assertion as a challenge and something negative rather than just something to reflect on.' (Interview 2)

Interviewees discussed that the background of practice leadership, whether this be clinical or non-clinical, impacted the focus and intent of safety culture measures.

'So, when we've had more veterinary qualified managers involved, I think it becomes very, very patient-centred. Whereas when we've had more business-minded leadership, I think it tends to lean more towards staff and public safety.' (Interview 5)

Alone working hampers safety culture

Traditional farm and ambulatory equine practice involve lone working at all times of the day. Participants argued how this business model made the management of safety culture difficult.

> *'Even when you can say, well, actually I just need to walk away from this from 10 minutes. We need to regroup, reassess the situation and then tackle it again. That's really hard when you're by yourself, working alone.'* (Interview 12)

Vets acknowledged that the professional consequences of working alone were higher.

> *'Out on a yard it's basically all on me. So, it's kind of my fault if anything happens, isn't it? And I've only myself to blame.'* (Interview 8)

> *'You're there, and it's on you to an extent. And therefore, I suppose, there's perhaps a greater importance for us as the individual in that circumstance to take on that responsibility and recognise that we're taking it on.'* (Interview 14)

Safety culture is practice dependent

Veterinary staff underlined how both the overall safety culture and individual safety culture measures vary significantly between practices. It was remarked that those with more centralised control (i.e. large corporate practices) had stricter policies in comparison to smaller practices.

> *'…in such a big hospital, you clearly see problems happen more frequently, so those problems become something you have to talk about sooner. Whereas I think in smaller practice where everyone's sort of getting along and the big problems don't happen very often because there's less happening…I haven't been in tiny practices for a long time, but when I was there, the safety culture was horrendous. If existent at all.'* (Interview 5)

This contrast between the management and governance of safety culture was linked to familiarity with treatment choices.

> *'I've been around a lot of different practises and there's things that you know has been completely commonplace in one practice and when I've done it in another practice, they're absolutely horrified and they're like, what are you doing? Why are you using that drug? But it's because they're unfamiliar with it. So, to them they're seeing that as me taking a massive risk, whereas actually I've been to practise where I use that all the time and I'm comfortable with it. So therefore it's. In that setting, not risky behaviour.'* (Interview 11)

3.434 Theme 4 - risk

The final theme of risk describes the way in which veterinary staff perceive, mitigate, and treat the risks associated with the veterinary profession. Discussion centred around the management of the considerable risks which exist and how these are often trivialised and underestimated.

Staff safety not prioritised despite considerable risk

It was remarked that the veterinary profession is inherently dangerous due to the variability in both patient and location of treatment. Veterinary staff discussed that despite these dangers, staff safety was not prioritised.

> *'When I was training, which sadly, was over a decade ago now, it (staff safety) was almost frowned upon. Like, if you like, you're putting yourself above your patient's kind of mantra'* (Interview 5)

> *'In black and white terms, your staff safety should be also now paramount.'* (Interview 12)

Participants further commented on the views that veterinary staff have towards their own safety.

> *'I think we do run the risk of becoming quite blasé about physical risk.'* (Interview 14)

Safety culture mitigates against risk

Participants viewed safety culture measures positively in the ability of them to mitigate a wide range of risks encountered with in the profession. Notably, participants described the role of risk in veterinary practice and how safety culture measures help guide practitioners on which risks to take.

'(Safety culture) is a combination of process, people and the ethos of the environment that you work in, therefore producing a culture…of understanding about how appropriate it is to take risks and what level of risks is acceptable for each individual situation' (Interview 9)

The importance of safety culture in risk management was highlighted, including that this is the primary role of safety culture measures.

'It's about reducing risk. It's not about making people have a nice experience.' (Interview 9)

Equine and farm practice are more risky

Common situations in both farm and equine were described by the participants, often noting the considerable risk that these practitioners face. It was remarked that these larger animals often make already dangerous situations worse.

'If anything, I think they (horses) contribute to unsafety in the workplace!' (Interview 12)

The significance of these risks were downplayed and interviewees described reactions from non-vets to these situations.

'Yes, it's risky, but it has always been risky. What's a little more risk on top of a known risk…So, I tell my husband, who is not a vet, and he would ask, "Why would you take that risk?" And it's like, well, the risk was already there. It was only a little bit extra that I took on. So, it was probably okay.' (Interview 12)

This idea of becoming overly risk tolerant just because it was normal was frequently described. Even though participants recognised unsafe and risky situations, they proceeded to carry out the task, deciding to just accept the situation.

'Is risky all the time and you just have to do it, so you just become immune to risk... I mean, it's just ridiculous. The things that you end up doing or seeing or getting

involved in and the things that our own horse owners do with their own horse that you're witnessing and thinking that's really unsafe.' (Interview 8)

This acceptance was further demonstrated when participants were responsible for others in unsafe situations.

'You're sort of responsible for the person clipping the horse, but their job is inherently really, really risky, and you can't prevent a horse from kicking them.' (Interview 8)

Participants described that a greater acceptance of risk and willingness to complete tasks in unsafe situations stemmed from differences in views.

'They're different attitudes and different norms' (Interview 6)

'I think it's (safety culture) important, but again, it's about the attitude, the norms, the beliefs that I'm not sure farmers are quite ready to embrace.' (Interview 6)

Finally, it was discussed how the equine industry is ran in a way which is inherently dangerous, especially in comparison to both small animal practice and other industries.

'I think that the particularly on the equine side, you know we if we genuinely thought as a profession that we want to do everything that we could to be mitigate risk, I think the model where people go out on visits in the middle of the night by themselves wouldn't you know wouldn't be a model that would be supported.' (Interview 12)

Risky and unsafe situations viewed as a challenge

A degree of adrenaline-seeking behaviour was seen where participants viewed dangerous situations as fun or a test of skill. Notably, this was viewed as an enjoyable and interesting aspect of the job.

'I suppose it kind of becomes part of the fun. Yeah, of being an equine vet that you

never know what you're going to be faced with. And you have to kind of adapt. And it becomes sort of, you know. A bit of a fun, bit of the job.' (Interview 8)

Others described how safety culture measures, which may prevent involvement in such situations, would be of detrimental effect to the reputation of the vet

'Can I (the assistant) do this TB test through this rickety old crush? No, I can't. What a disaster, if I then turn around and say, well, don't worry, farmer, because I will. I'm sorry about my, you know, pathetic assistant. But you know, I'll come and sort you out.' (Interview 14)

This was further compounded by the idea of a power-centric culture, where veterinary staff must complete all tasks to maintain their reputation.

'So, I think there's a way to go, I suppose...to get beyond what I think still exists, certainly within the farm side of our profession, which is a degree of macho culture. And you see that in all sorts of ways. You see it in terms of our CPD courses, being the last person at the bar, and yet the first one in for the lectures in the morning, and who needs sleep and all that kind of stuff. But you also see it, I think, in terms of approach to personal safety.' (Interview 14)

Greater risks taken to ensure patient safety

Personal safety was often put at risk in order to guarantee patient safety. Participants described situations where they had put themselves in danger of injury, despite knowing and understanding the risks.

'You know I've lifted a 45Kg dog on it. So, on my own and carried it. And I know it's potentially bad for my back, but I do it anyway, so I think we are in our heads better at prioritising patient safety.' (Interview 11)

'It's just the size of our patients that makes it more risky. So things like, you know, induction of anaesthesia.' (Interview 12)

3.5 Discussion

3.51 Study design

Interviews canvassed the experiences of both vets and RVNs from the main practice sectors (small animal, farm and equine), contrasting similar studies (Gibson et al., 2022, Oxtoby and Mossop, 2019) which do not delineate the practicing backgrounds of their interviewees. This is valuable as this enables comparisons between the different areas of the profession to be drawn.

Previous studies (Gibson et al., 2021, Gibson et al., 2022) exploring the just subculture have utilised a range of methods including both grounded theory (Charmaz, 2017) and thematic analysis (Oxtoby and Mossop, 2019) as described by Braun and Clarke (2006). However, this study benefits from the use of reflexive thematic analysis (Braun and Clarke, 2019). The focus on reflexivity has enabled the researcher to acknowledge their role in the interpretation of the data, enriching the thematic analysis and contributing to the generation of meaningful, robust themes.

3.52 Theme 1 - understanding

A deficit in the understanding of safety culture was a key finding from this qualitative study, an insight that mirrors the scoping review conducted (chapter 2). This result contrasts that of medicine, where participants in similar qualitative studies exhibit good understanding of what safety culture comprises and their role within it (Abdelaliem and Alsenany, 2022). This disparity in understanding could be attributed to differences in the literature. Veterinary publications often exploring discrete aspects of safety culture, such as the just subculture or checklists while both medical research (Sammer et al., 2010) and policy (NHS, 2022) often adopts a more holistic view, focusing on safety culture as a whole, rather than individual aspects. Nonetheless, there is still veterinary literature that promotes and evidences the importance of several safety culture properties, so the lack of understanding cannot be attributed to this solely. Since the publication of *To Err is Human* (Kohn et al., 2000), medicine

has benefited from numerous publications over a period of decades as opposed veterinary safety culture, which has only developed over the last five years. Despite the differences, veterinary staff continue to draw comparisons with doctors and nurses, even though considerable differences exist. Therefore, whilst understanding was considered poor, this is to be expected of a field in its infancy and although this may seem negative, time must be allowed for established norms and attitudes to change. Considering these, implementing a longitudinal study to track changes in attitudes and evaluate the effectiveness of programs aimed at improving them would be highly beneficial. Such an approach would allow researchers to identify trends and shifts in understanding, providing valuable insights into how educational and policy interventions can be fine-tuned to better serve the veterinary profession.

The concept of a just culture or no-blame culture was the most recognised facet of safety culture, which is in line the distribution of veterinary literature (Figure 11). Study participants echoed views similar to those reported in previous studies by Oxtoby and Mossop (2019) and Gibson et al. (2021), indicating that both the attitudes of veterinary staff and the challenges they face have remained consistent. Notably, the absence of a universal reporting system (a facet of the just subculture) for the profession renders these views on just culture somewhat inevitable. This situation starkly contrasts with aviation and medicine, where public agencies such as the Civil Aviation Authority (CAA) (CAA, 2024) and the NHS (NHS, 2024) actively oversee incident reporting.

The introduction of *VetSafe* (VDS, 2024), an online incident/accident reporting tool developed by the VDS in 2017, has facilitated local-level incident reporting and enhanced quality improvement within veterinary practices. However, despite views like those expressed by Kernot (2024), suggesting that *VetSafe* aligns the veterinary profession with medicine, it is not a universal reporting tool. Access to *VetSafe* is restricted to members through a login, which limits broader access to reporting; this may cause it to be perceived more as a membership benefit rather than a comprehensive system. A further limitation of this system is its lack of enforceability; unlike the CAA, which can prevent the use of unsafe equipment, the VDS has

no statutory power to enforce safety measures. Moving forward, if the veterinary profession is serious about enhancing incident reporting, it should consider establishing a system similar to those in aviation and medicine, run by the profession for its benefit. Such a system would facilitate national-scale learning from incidents and improve access to reporting for a greater number of stakeholders.

Vets and all those working in practice must ensure that they are compliant with the Health and Safety at Work Act (1974). The importance of this legislation was not fully grasped by study participants, with health and safety seen as trivial or an unnecessary bureaucracy. Moreover, this perspective contrasted the view that veterinary medicine was a safety critical industry, such as nuclear power, as in said industries safety is a goal placed above all others (NRC, 2011). Publications from manufacturing demonstrate that employees possess good understanding of the importance of health and safety and associated measures (Walters and Haines, 1988). These views, combined with the wider negative view of safety culture as a whole could be linked the lack of buy-in which this study highlighted as a key factor in the perception of safety culture. Within this context, enhancing intellectual buy-in - how staff comprehend and value safety culture - is crucial. Vets must prioritise the welfare of their patients above all else which is enshrined by the RCVS oath on entry to the profession (RCVS, 2023a), indicating that emotional buy-in is typically already present. However, aligning their understanding of safety culture with their professional commitment is essential for improvements in performance. This view is mirrored in other industries, where the importance of obtaining buy-in from employees is linked to both business performance (Thomson et al., 1999) and safety performance (Summerill et al., 2011). Therefore, it is important for veterinary leaders to adopt a change management style of leadership, explain the ‘why’ for new safety culture measures rather than their blanket adoption. Such an approach is likely to yield better compliance and therefore, improved patient and staff safety outcomes.

3.52 Theme 2 - operational aspects

The veterinary profession is unique, with staff needing to balance animal welfare with the finances of the owner, noting that what is best for patient and staff safety may not always be possible. Finance impacts safety culture in two distinct ways: firstly, through the personal finances of the owner, which affect the resources available to the vet; and secondly, through the practice management's commitment to investing in its safety culture.

Client finances are often a limiting factor affecting the vet's ability to mitigate risks to both the patient and staff involved in its treatment. For example, the refusal of sedation or pre-operative blood tests may increase the likelihood that an adverse event occurs. The cost of veterinary treatment is an area which is increasingly under scrutiny (CMA, 2024) and has been demonstrated to be a barrier to veterinary care (Morris et al., 2021). Consequently, veterinary staff may be inclined to consider treatment options that aim to minimise the financial burden on the owner, potentially at the expense of increased risk. This could include the use of unlicensed treatments or procedures that are outside the practitioner's scope of expertise. Such practices likely increase the risk of harm to the patient, a situation that contravenes the principles of a positive safety culture and the RCVS Code of Professional Conduct (RCVS, 2023a). Where such risk taking is warranted such as in an emergency, robust mitigations should be implemented in order to safeguard patient and staff safety as much as possible.

However, the successful implementation of mitigations is contingent upon veterinary management's investment in a practice's safety culture, which was identified in this study as a perceived barrier. The value of safety investments has been explored in commercial businesses, where Huang et al. (2007) demonstrated that managers generally perceive such investments as beneficial, outweighing the associated costs. This contrasted with the views demonstrated in the study where expenditure was universally viewed as negative. Safety culture should not be associated with significant capital expenditure, checklists for example, come at little to no cost (Ebeck, 2022). To improve these negative perceptions, veterinary management should utilise the free resources provided by various veterinary organisations to

positively impact the practice's culture. Whilst a lack of time is often also seen as a proponent, the implementation of these measures can be counted towards CPD, making this an effective use of time and financial resources. Further research quantifying the financial impact of patient and staff safety incidents could significantly strengthen the case for investment in safety. By demonstrating the economic benefits of a positive safety culture, such data could encourage veterinary leadership, both clinical and non-clinical, to prioritise these initiatives more highly, similar to other high-risk industries.

Teamwork, identified in this study and corroborated by the scoping review, is recognised as a crucial element of a practice's safety culture aligning with research in both veterinary medicine (Turner, 2021) and medicine (Sammer et al., 2010). The current recruitment and retention crisis, as outlined by Gall (2024), has had a profound impact on the practice team as the increasing use of locum or temporary staff can cause problems where personalities and clinical opinions clash. These disruptions to the practice dynamic can cause both patient and staff safety events and as a result, practice management must take active steps to monitor the practice team and intervene where necessary. Furthermore, practice management must consider the effects of reduced staff numbers when designing rotas. The profession has no stated minimum 'safety net' which is the minimum levels of staff to ensure not just patient safety but also staff safety. This is in stark contrast to medicine, where each NHS trust must produce a local safe staffing policy (NHS Leicestershire Partnership, 2024) to guarantee the minimum levels of staffing for patient safety. No such policy exists within veterinary medicine, where it is common practice for minimal, if any, staff to remain overnight with a patient. Clearly the operational aspects in having a greater number of personnel outweigh the perceived benefit to both staff and patient safety. Further research is indicated to investigate whether like medicine (Tamburello, 2023), there is a correlation between staffing levels and patient/staff safety.

3.53 Theme 3 - control

The veterinary profession uniquely relies on owners and farmers to safely restrain animals, despite the owners' lack of experience and knowledge, and the sub-optimal facilities that the farmers may have. The study's findings closely mirror those of Irwin et al. (2019) and Fowler et al. (2018) demonstrating that the handling of animals by owners presents significant risk. This issue is particularly acute in large animal practice, where vets have little control over the environment in which they work, thereby limiting the effectiveness of safety measures commonly implemented in small animal practice, such as quality improvement. The effectiveness of safety measures is further limited by lone working, a common scenario in large animal practice. As identified by Irwin et al. (2019), working alone exacerbates the challenges, therefore increasing the risks faced in uncontrolled environments. Despite being a core component of large animal work, there is little in the way of education that aims to mitigate the significant risks faced with lone working. Studies in transport (Olson and Austin, 2001) identified the effectiveness of a behaviour-based safety approach to reduce safety events associated with lone working. However, similar approaches and training specific to lone working have yet to be explored in veterinary medicine. Assessing the effectiveness of safety training here could enable vets to exercise more control over their safety and lead to a reduction in incidents and accidents.

Operating without a dedicated body to regulate or champion patient safety, the profession faces significant challenges in implementing consistent safety measures. Consequently, there is a substantial dependence on individual practitioners and practices to adopt, adhere to, and enforce specific safety protocols. This reliance on individuals results in significant variability in both safety culture and measures across different practices, which undermines standardisation and diminishes the overall effectiveness of these measures. Adherence to safety measures is likely to depend on individual ethics, as these shape the perceived value of an animal's life and thus determine the thoroughness with which safety measures are followed. When applied specifically to checklists, a common safety measure, nursing research

has demonstrated the role of personal ethics in influencing the completeness and accuracy of how these tools are used, as they can sometimes encourage superficial compliance if ethical considerations are not prioritised (Kearney and Penque, 2012). This suggests that for safety measures to be effective, institutions must not only implement these tools but also foster an ethical culture that emphasises the integrity of following through with the intended actions. In medicine, this is balanced with a legal obligation, as noted by (Kangasniemi et al., 2013), which enables regulators to take meaningful enforcement action should those personal ethics not align with the minimum legislative requirement. However, the veterinary profession lacks an enforcement capability, placing the onus on individual ethics to ensure that safety measures are followed correctly. Therefore, ethical training and support should be integral components of education to ensure that safety measures are not only performed but are carried out with the highest standard of care and accountability.

3.54 Theme 4 - risk

Individual risk tolerance was identified in this study as being notably high, with veterinary staff willing to engage in risky situations despite being aware of the potential dangers. This observation aligns with the findings of Irwin et al. (2019) who demonstrated that vets often exhibit a high risk tolerance, driven by a perceived need to prioritise the welfare of the animals and wishes of the client over their own safety. The perception of risk is underexplored with little research examining it as a standalone topic. However, studies in medicine (Rebecca et al., 2019) have established a positive correlation between clinical experience and risk tolerance. The findings indicate that doctors with more experience tend to demonstrate superior skills in risk assessment and management. If the situation is similar in veterinary medicine, this could be dangerous as unlike in medicine, the physical risk is greater and therefore complacency could pose a significant risk to life. Such a scenario underscores the need for a positive safety culture that actively mitigates these risks. Integrating risk management strategies, specifically incorporating Dynamic Risk Assessments (DRAs), could strengthen veterinary safety culture. The role of DRAs in veterinary medicine has been

insufficiently explored, despite the benefit these tools could have through the enhanced management of risks faced by veterinary staff. In contrast, DRAs are integral to the risk management strategy of the armed forces (MOD, 2023). This process involves the completion of risk assessments well in advance of an operation and reviewed periodically to ensure relevance. Subsequently, DRAs are performed immediately before the commencement of the task. This ensures that previously evaluated risks are still accurately assessed and that the implemented mitigations remain effective. Such a system could prove useful to veterinary managers and ensure that front-line staff account for and mitigate the risks they face. However, the implementation of such a process would require a positive safety culture, where these activities are given due diligence that they deserve and are not treated as a box ticking exercise. Therefore, further studies exploring the perception of risk and attitudes towards risk management in veterinary practice are warranted. Such research could determine whether this issue is pervasive and requires sector-wide attention.

In this study, staff reported that navigating dangerous situations whether personal or patient risk, heightened their job satisfaction. This paradoxical enjoyment of risk, often seen as manageable and even enjoyable, may align with veterinary staff's sense of duty towards animal welfare. While Irwin et al. (2019) explored the acceptance of personal risk in veterinary settings, the specific link between risk and job satisfaction remains largely unexplored in this field, unlike in emergency services where research has demonstrated that physical danger adds meaning and motivation to work (Jermier et al., 1989). The unique thrill and professional fulfilment derived from overcoming challenging situations suggests a complex dynamic between risk acceptance and job satisfaction. The exploration of this relationship could reveal important insights into motivational factors within veterinary practice, particularly whether this thrill-seeking attitude is beneficial or leads to unnecessary exposure to danger. Risk management training is likely to yield significant benefit, enabling veterinary staff to navigate the interplay between personal risk and duty of care.

3.6 Limitations

This study utilised both interviews and focus groups to generate the data needed to address the research aim, following previous studies in veterinary medicine that explored aspects of veterinary safety culture, notably the just subculture (Oxtoby and Mossop, 2019, Gibson et al., 2021). However, this study differs in the number of focus groups and participants. It opted for a focus group of three people, in line with guidance from Braun and Clarke (2013) as it was believed that a smaller group size would allow for deeper discussion and increased participation. Only a single focus group was conducted, as veterinary students struggled to grasp the concept of safety culture. They admitted that their lack of clinical and employment experience made it difficult to understand the importance and relevance of various safety culture measures, with checklists and protocols being notable exceptions. It has been demonstrated that veterinary students rank knowledge of practice management as a less important attribute (Rhind et al., 2011), which could explain their lack of comprehension. As a result, the decision was made not to hold further focus groups with veterinary students, as additional sessions were unlikely to contribute to the study's aim.

3.7 Conclusions and recommendations

This qualitative analysis of veterinary safety culture highlights a nuanced understanding amongst veterinary staff and students. The complex interplay between the responsibility to animal welfare and the acceptance of risk underscores the need for the profession to have a strong, robust safety culture. This study has demonstrated that, despite considerable publications, veterinary safety culture remains an elusive concept. Whilst participants identified many safety culture measures, the understanding of them was limited, posing further questions about their effectiveness in practice. Overall, more concerted efforts must be made to ensure all veterinary staff understand their role within a practice’s safety culture, and how their actions can both affect staff and patient safety.

Key recommendations include:

- Education – This study revealed that vet students struggle to grasp many safety culture concepts. Therefore, efforts must be made to determine the optimal level for introducing safety culture education. Ideally once a vet has clinical experience, such as during Vet GDP or CertAVP training. Such an approach would allow greater comprehension of the topics and enable vets to apply their clinical experience to see where these measures could make a meaningful impact. Further CPD should be offered to veterinary staff as they advance to management roles, helping them stay updated with the latest safety culture practices. This, in turn, would facilitate the effective implementation of these measures within their teams and support management in remaining knowledgeable and proactive in enhancing the safety culture of their practice.
- Establishment of a safety body – A Delphi consensus study could be used to determine if, with the next round of legislative reform, an independent body should be established to regulate and champion both patient and staff safety within the veterinary profession. This body should be modelled on similar bodies in medicine/aviation, taking control of incident reporting and analysis. This new body should possess the legislative authority to enforce safety standards, issue penalties for non-compliance, and provide guidance for continuous improvement. Additionally, this body should engage in public and professional dialogue to enhance awareness and understanding of safety issues.
- Practice standards – In lieu of an independent safety regulator, the RCVS should work to integrate safety culture more widely into its Practice Standards Scheme (PSS) (RCVS, 2024). While the PSS sets a benchmark for safety culture with the inclusion of several safety culture measures, these are not always compulsory for accreditation, such as the use of incident and accident reporting. Furthermore, the way in which PSS is awarded means that a practice does not need to implement many of the measures to achieve accreditation. To enhance the effectiveness of the PSS, additional safety

culture measures could be incorporated, coupled with a stricter approach to awarding accreditation. Stricter requirements would promote a more consistent adoption and standardisation of safety culture measures across all practices, facilitating further research into their effectiveness and ensuring a higher standard of care. Standardisation would also allow for better comparison and benchmarking across practices, fostering continuous improvement. Although this approach would lack statutory powers, it can still drive significant improvements in patient and staff safety in a short period, thus negating the need for a complex legislative overhaul.

Chapter 4: Conclusion

This thesis has explored the current state of veterinary safety culture by mapping the existing research landscape and investigating veterinary professionals' experiences. From this analysis, it is evident that veterinary safety culture is in a transitional state—neither fully established nor completely absent. While there are challenges that the profession must overcome, strong foundations have been set upon which a robust safety culture can be developed.

Traditionally centred on checklists, protocols, and reporting, veterinary safety culture encompasses much more. Identifying barriers and misconceptions, such as the perceived wastage of time, is vital for ensuring effective implementation of safety culture measures. Addressing these issues through an integrated educational approach—incorporating elements of safety culture into undergraduate, postgraduate (VetGDP/CertAVP), and continuing education (CPD)—can promote a shift in attitudes and achieve greater buy-in.

A broader, more complete assimilation of safety culture into everyday practice is needed, with successes championed and setbacks documented and learnt from. Education is central to this development, with the potential to improve knowledge and enable greater use of safety measures, fostering a contextual approach to veterinary care. Ultimately, an integrated, positive safety culture will safeguard against avoidable harm, enabling all members of the profession to uphold the welfare of both patients and staff.

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Appendix 1 - Record of credits gained during MRes

Table 8 - Credits awarded in accordance with SVMS policy (University of Nottingham, 2024a)

Activity	Dates	Time spent	Credits earned
Demonstrating in practical classes – Urine analysis	28 Aug 23	3 hours	3
Attendance and presenting at the VPHA/AGV conference.	15 Sep 23 16 Sep 23	2 days	7
PG representative to the SVMS safety committee.	18 Sep 23 12 Dec 23 05 Mar 23	6 hours	6
SVMS facilitation training	19 Oct 23	1 hour	2
SVMS small group facilitation	10 Nov 23 04 Mar 23 15 May 23	3 hours	3
Attendance at Patient Safety Conference	08 Nov 23	1 day	2
Attendance and presenting at the BSAVA Congress	22 Mar 24	1 day	3
		Total credits earned:	26
		Total required for MRes:	20

Appendix 2 - Abstract presented at BSAVA Congress 2024

Objectives

Veterinary safety culture is traditionally associated with key elements such as checklists and the promotion of a just culture. However, there are additional factors likely to contribute to the reduction of avoidable harm to both staff and patients. This scoping review sought to map the existing literature to determine the current state of knowledge regarding safety culture, establish areas that the profession has made significant progress in and identify those areas that warrant further investigation.

Methods

A literature review following the PRISMA-ScR guidelines was performed on 5 online databases. Publications were reviewed against eligibility criteria. Data was extracted separately from research articles, opinion (narrative) pieces, with the related subcultures/domains charted. The review was registered with Open Science Framework.

Results

A total of 1500 publications were identified, of which 106 were included in the final review: 58 opinion pieces, 42 research articles, 5 case reports and 1 poster. Publications were indexed by the subcultures/domains of safety culture noting that some discussed more than one. The literature showed that checklists and just culture (45 and 47 articles) were the most discussed, while teamwork (6 articles) and patient-centred approaches (3 articles) received the least attention. The staffing elements of safety culture were significantly underrepresented accounting for a total of 16/106 compared to 90 focusing on patient safety aspects.

Statement (conclusions)

The review highlighted that there are significant gaps in the understanding of safety culture. Addressing these gaps in understanding has the potential to reduce the frequency of avoidable harm to both staff and patients.

Appendix 3 - Scoping review results extract

Scoping Review - Results.xlsx

Appendix 4 - Participation information and consent form

Participant information sheet

Researcher Identifier: Thomas Conway and Prof Kate White

Research contact details: Primary Supervisor: Prof Kate White

Kate.White@nottingham.ac.uk

Project title: "***Veterinary Safety Culture: a qualitative analysis"***

Invitation to participate in academic enquiry study and allow use of the data collected

My name is Thomas Conway, and as part of my MRes intercalation year, I am undertaking a research project entitled "**Veterinary Safety Culture".**

Before you decide if you wish to partake within data collection, it is important for you to understand what is required within the data collection of this research. Please take time to read the following information carefully. Please do not hesitate to contact my supervisor to ask any questions if any of the information is unclear. Thank you for your time in considering partaking within this study.

Purpose of the research study

Safety culture is 'The set of beliefs, norms, attitudes, roles, and social and technical practices that are concerned with minimising the exposure of employees, managers, customers and members of the public to conditions considered dangerous or injurious'(Turner et al., 1989). There is limited research on veterinary safety culture, and none that specifically analyses the views of veterinary staff.

This study will utilise qualitative data to analyse veterinary staff's attitudes, beliefs and knowledge of safety culture, using existing models and definitions as a handrail.

Explanation of the research process

Interviews/focus groups will be conducted either face-to-face or via Microsoft Teams(Microsoft, 2023). These sessions will be recorded and subsequently transcribed. Reflexive thematic analysis(Braun and Clarke, 2006, Braun and Clarke, 2019) will be employed to analyse the data ensuring prevalent themes are mapped and understood. This rich analysis will highlight the existing views, enabling the identification of areas where interventions may be necessary to improve the overall understanding of safety culture within veterinary medicine.

Reason for selection and withdrawal processes

It is up to you to decide whether you wish to partake within this study. If you do decide to take part, you will be asked to clearly read this participant information sheet and completed a form illustrating your informed consent. If you decide to partake within this study, you are still free to withdraw, without reason, up to the designated point of withdrawal (05 Mar 24).

Harms and benefits of participating

There are no distinct harms to participating within this research. Any data provided by yourself shall remain anonymous and be stored securely with the primary supervisor on a password-protected computer. Benefits of your participation are that the information you provide can aid the improvement of understanding of safety culture within the profession.

Confidentiality

To abide by current GDPR regulations, all information you provide during the research shall remain secure.

Ethics approval

This study has been approved by the University of Nottingham School of Veterinary Medicine and Science (SVMS) ethics committee (approval number: 3894 230726).

What will happen to the results?

The results from this study will be written up for publication within a peer-reviewed journal.

Thank you for taking the time to read this information sheet. I sincerely hope that you may be willing to participate in this research. If you are happy to consent, please sign the associated consent form provided.

If you are concerned with any component of this study, or would like to know more, please do get in touch. My supervisor can be contacted on kate.white@nottingham.ac.uk

Participant Consent Form

Name of Researcher: Thomas Conway and Prof Kate White

Project title: "***Veterinary Safety Culture"***

Material gathered for this research will be treated as confidential and securely stored. This may include interview/focus group transcripts, informal discussions with participants, researcher's field notes and observation notes. Please read the following statements and tick the relevant box below concerning the collection and use of the research data if you agree.

Statement by Participant

		Please sign once agreed
1.	I have volunteered to take part in this project	
2.	I know I can withdraw at any time without being disadvantaged	
3.	I am satisfied that the results will be stored securely, according to current GDPR laws	
4.	I know that the results may be published but they shall not be linked to me. My anonymity is assured.	
5.	I am aware of any possible risks and benefits of the research study	
6.	I have had the chance to ask questions regarding the study and these were answered appropriately	
7.	I know that I will not receive any money for taking part	
8.	I agree to inform the researcher immediately if I feel uncomfortable	

I have read and understood this form. I agree to take part in the project entitled

"***Veterinary Safety Culture: a qualitative analysis".***

Participant Name:

Participant Signature: …….

Date:

Appendix 5 - Interview and focus group guide

Interviews

- Have you heard of the term safety culture before?
- I would like to know what you know about safety culture. What do you think it is?
- How would you define safety culture.
- Here is a definition of safety culture for the veterinary profession, what are your thoughts on this? Does this clarify what safety culture is?
- Here is a diagram that outlines a series of social and technical practices, what are your thoughts? Are there any that you particularly agree or disagree with? Do you have any experiences with these in practice? What is your opinion on them?
- Have you experienced and patient or staff safety incidents in practice? How were these managed? Is there anything that could be done differently?
- Do you think safety culture is an important part of veterinary medicine? Do you think that we have a good safety culture?
- Do you think that this is a safety critical industry?
- How do you think veterinary safety culture could be improved?
- Is there anything else you would like to add?

Focus groups

- Have you heard of the term safety culture before?
- I would like to know what you know about safety culture. What do you think it is?
- How would you define safety culture.
- Here is a definition of safety culture for the veterinary profession, what are your thoughts on this? Does this clarify what safety culture is?
- Here is a diagram that outlines a series of social and technical practices, what are your thoughts? Are there any that you particularly agree or disagree with? Have you seen any of these being used in practice?
- How effective do you think these measures are?
- Have you experienced and patient or staff safety incidents in practice? How were these managed? Is there anything that could be done differently?
- Do you think safety culture is an important part of veterinary medicine? Do you think that we have a good safety culture?
- What do you think your role in safety culture is?
- Do you think you receive enough education on safety culture? How can we improve this?
- Is there anything else you would like to add?

Appendix 6 - Final code book

Table 9 - Theme 1 - understanding.

Code	Example
Attitudes of 'just getting on with it'	‘We've often had this culture of you just get on with it.’ ‘Just getting on with it.’
Blame environment exists	‘I think that is the main problem is that people feel like there is a blame culture and I think that makes everything else fall.’
Buy in and the importance of bringing people along	‘Like, say it's quite hard with getting people on board with doing things like that that they don't see as a benefit.’ ‘So I think whatever you do, in order to create a safety culture. It's got to be very clear what that is to absolutely everyone and they've got to buy into it and be part of the team. Otherwise, it's destined to fail.’ ‘It's convincing people in the workplace about the validity of it, I think that's the problem.’

Code	Example
Can't avoid harm if we do not know it is causing harm	'…certain things which we're doing in animal dentistry, we might be…getting away with because…unless they have very serious complications, we will never find out'.
Communication requires improvement	'Communication is one of the worst areas where we do really badly.'
	'The other problem is because of that level of vitriol don't really want to speak to again for a bit. Like, I've got no inclination that I want to go up and talk to that person again. We're supposed to be team. To enjoy the team, I need to have a good working relation with people.'
Considered aspects of safety culture in companion practice only	'I suppose some of it …I will have done, have heard quite a bit about the patient centred stuff from a companion animal aspect where the clinicians meeting on that which was interesting.'
Cynical views of safety culture	'That (safety culture) can become very much a tick box exercise.'
	'Absolutely. But my concern is that a lot of the times it's, it's a tick box exercise.'

Code	Example
	‘The rest of it's a bit corporately speak. Management type speak.’
Effect of popular culture in shaping attitudes and beliefs	‘A culture of arrogance and, you know, being trying to be House or Meredith Grey or something. And you know, like that kind of idea of you should just know everything.
Food safety the only safety critical element of profession	‘I would say yes, in terms of food safety and you know, and food security.’
Getting better at reporting	‘Make mistakes or things don't go as planned, because I think we're very quick at. Having big post operative care talks when surgery doesn't go right, but we're not very good at if you know reporting faulty bits of equipment, faulty plug.’
Importance of 'Just' subculture not recognised	‘Smelling alcohol on your colleagues breath, you don't wanna, you don't wanna stitch them up.’
Improvements in safety culture plateauing	‘Things are probably a little bit better, but. I don't think you've noticed.’
Just recognised as important	‘I think probably the just culture is the main starting point.’

Code	Example
Lack of accountability as a student	‘I feel like because you're not accountable. That the safety culture is not less important, but it's less noticeable.’
Lack of awareness on what safety culture comprises	‘I feel like because you're not accountable. That the safety culture is not less important, but it's less noticeable.’ ‘Ohh God I've not seen anything before in practice like this.’
Lack of evidence supporting and informing individuals on safety culture	‘I mean, I think evidence-based, I don't think as a profession we're particularly good at doing.’ ‘I think with the evidence-based thing, that's probably something where we could massively improve. That's not done particularly well.’
Lack of patient centred approach	‘Or patient safety from the perspective of handling or how well we're thinking about the patient. Having them hospitalised, doing certain procedures without thinking about the cognitive and mental well-being.’

Code	Example
Lack of thought into why we do certain things	‘And sometimes, you know, with we're trying to cut the corners and do things because we're justifying certain decisions that they are actually still safe. But I don't think there's lots of thought going into it. I might be completely wrong and very unfair, but I don't think a lot of the times people discuss certain things. Should we really do this this way?’
Limited exposure to safety culture whilst at vet school	‘I think we get taught about checklists. Don't know what the ones we did other than the anaesthesia checklist. Yeah. And is there a checklist in CPR? Yeah. Yeah, right. Because it was that video, wasn't it?’ ‘That I've learned a lot about safety culture in this focus group and that maybe it should be taught in some sort of professional component of vet school. ‘
Mistakes established as an important aspect of learning	‘Part of being human, I just don't think there's anything special about vets. Yeah, people make mistakes. We all make mistakes, and I don't think in the workplace you make a clinical decision or you do something at the time that you think is in the best interest for the patient and your client. And hindsight is a

Code	Example
	wonderful thing, isn't it? And I think we've all made decisions where you've looked back and thought that wasn't the best.’ ‘I think mistakes are inevitable’
Non-clinical leadership lacks understanding	‘If it's something where you have a problem and some potential solutions, it's really important that the person that you are reporting that to has enough understanding of what it what the role that you do so that they can see that it when it is truly a problem, and to whether that solution fixes it or not.’
Not linked to type of practice ownership	‘I think most kind of point to the difference between corporate and independent practice, and I don't think it's as straightforward as that at all.’
Overlap between safety culture and a 'good workplace'	‘So a little bit different to safety culture, but huge overlap I would suggest. So yeah, I think something like this gives you a framework that you can work from, but I definitely encourage you to look at the BVA Good Workplace Guide.’

Code	Example
Quality improvement recognised as an important component	‘What was learned from there is that we will never get receptionist to handle cats in practice because it's not something they have physically been trained in doing.’
	‘Qi kind of thing where we sit and look at cause and effect.’
Recognition that teamwork is important	‘I think we are an amazing team even when you're not in practice.’
	‘I think the first thing I'm really hot on is teamwork.’
	‘The most important thing is a team.’
Reporting is inconvenient	‘A lot of people don't actually like doing it (reporting).’
	‘It's (reporting) time consuming. So people either forget or don't bother’
Reporting recognised as trigger for improvement	‘I think if you can get that bit right (reporting) and people feel like they can talk about mistakes openly, you know they can have a colleague come to them and say ohh by the way, I noticed that you did this. This is wrong, and here's the reasons why and not take offence by it. I think that opens up a really good kind

Code	Example
	of opportunity for everything else for you know, people to understand that. Learn how to get better, use evidence based veterinary medicine. The teamwork I think comes in with the just culture. Like if you trust your team. You're gonna have that. So I think it all for me anyway, I think that is kind of. The very bottom line that you need to make this work.'
Role of safety culture in negligence	'I think it also this is gonna sound awful it (safety culture) assumes that…well, it was everyone's fault, and I think sometimes it can be someone's fault. And while that's I'm not saying like ohh if an operation went wrong and a surgeon messed up, that's perfectly understandable, you know something went wrong. Things go wrong. But if people aren't knowledgeable enough…this insinuates that you get an infinite amount of strikes.'
	'So I think when you're ignoring evidence, you're ignoring procedural advice, you're ignoring your peers. That's when it becomes negligent.'

Code	Example
Safety culture a difficult concept to apply	‘This definitely emphasises what safety culture is. But it's hard to describe. There's a lot of moving parts here and I feel like a lot of things feed into each other.’
Safety culture CPD is sub-optimal	‘I think there's a lot of times you'll get people coming round to do CPD on human factors, and they'll often talk about just culture, but they'll talk about just culture in isolation to other things. I think the problem is…the phrasing of just culture and the presentation of just culture is, I think, a lot of people feel like they're…being attacked for gossip. I think that's the issue with the just culture. It's not just culture as the wrong thing. We should have a just culture, but it's how do we frame it and how do people think about it? And then also, how do we not just penalise people for being human beings?’
Safety Culture described as important	‘100% hopefully no one's saying no to that.’
Safety culture education occurs in practice	‘It's kind of hard to understand when we're not in an environment.’

Code	Example
	‘It's the sort of thing that you get from placements without really knowing that you're getting it from placements.’
Safety culture improving	‘I think it's (safety culture) massively improving.’
Safety culture is holistic and should be treated as such	‘So in the just thing if there's trust, there could also be a massive part of leadership and a massive part of teamwork…Because you trust in you, your leader. If something does go wrong that you can talk to them, you know, I mean, I feel like there's a lot of intrinsic parts of this so.’ ‘(Safety culture is) interconnected and it does depend on the situation.’ ‘That you need to each all the parts to work together.’
Safety culture is not a one-off activity	‘And you know, are we using that because I'm supposed, you know, it's not one off thing, it's just putting it in practice with all the checklists. We know that the checklists are actually a pain initially until you learn really work smoothly with them. So initially process is a bit more slower just because you kind of have to think about your mind more mindful of what you're doing step by step. Once

Code	Example
	you get to learn to adapt to it, it's going to be second nature and they become superbly useful. You're just doing it.’
Safety culture is not always black and white	‘I think unfortunately there sometimes we make it (safety culture) very black and white. And it's (safety culture) not black and white. It's (safety culture) too grey.’
Safety culture not discussed enough	‘It's (safety culture) not something I hear like the other staff members talking about.’
Safety culture seen as a waste of time	‘It can be quite difficult to make people get on board with something that they feel is perhaps a waste of time.’
	‘I'm sure a checklist definitely has its place. I just think I would struggle with the time constraints and everything else’
Technology should be used to help improve safety culture	‘Practice management systems produce that (checklists) for you.’
Unqualified persons do not distinguish the importance of safety culture	‘I think I'd worry that they'd (Safety culture measures) make me look incompetent. I, if I'm honest.’

Code	Example
Unsure on how to measure and assess safety culture	‘So how would we do benchmark safety culture?’ ‘OK, so I've never seen that tool (NVSCS).’
Us and them attitude and beliefs between vets and RVNs	‘That's the nurse, and that's the kennel assistance. So anything where they consider themselves to be in a hierarchically superior position, whereas if you see those same people talking to a vet, so hierarchy similar, the tone and nature of the communication is completely different.’
VDS associated with regulatory body, not an insurance company	‘I think if someone told me or you could report it via something with the VDS, I'd kind of feel like it had to be a really big thing in order to involve something like that, you know, patient safety being completely eroded, someone being put at risk of, you know, really serious injury as opposed to a better method for making sure that we didn't leave, you know, capped needles close to the washing machine or something like that. You know that, to me would feel like something that wasn't big enough to sort of go down that route.’
Veterinary medicine is not safety critical	‘No, probably not really.’

Code	Example
Veterinary medicine viewed as safety critical	‘In very small scenarios, yes. So I guess if we're dealing with zoonotic level infections and we're managing those appropriately, then that could easily escalate.’ **‘**Interviewer: Is veterinary medicine a safety-critical industry? P7**:** Yes’
Veterinary safety culture less developed compared to others	‘I go to or have been to a hospital every time you move rooms or wards or you go to a different station in the in the hospital somebody will pick it up and they always say what's your name, date of birth and the first line of your dress or. We don't tend to do that.’ ‘We can learn things, you know, we can learn things from lots of different industries, whether it's human healthcare or whether it's, you know, look at things like aviation or construction industries that have an awful lot of safety sort of strategies and processes built in there, don't they?’
View that safety culture is only health and safety	‘In a role would be like a manager pointing out that you shouldn't be running with scissors.’

Code	Example
	Safety culture is ‘all the people in that environment buy into the idea of, you know, respecting each other's health and safety and facilitating an environment which makes it easy for that health and safety to be guarded, as opposed to, I suppose, the kind of, you know, just kind of shut up and get on with it and get the job done type approach.’
You either have or don’t have a safety culture	‘I kind of thought practice has safety culture or it doesn't have safety culture is I think what my initial impression was.’

Table 10 - Theme 2 - operational aspects

Code	Example
Client wishes prioritised over safety	‘I would say we perhaps put the client too high up in the list as well sometimes. So, yes, of course, I'll do that TB test behind a rickety piece of, pallet board for you because that's the way we're set up and this is the job we've got to do.’
Managers too busy to think about implementing a positive safety culture	‘Some of your smaller independents, if you're a partner and you're practicing and you're trying to do finance, HR and help the person that's having a rubbish day, this type of thing (safety culture), like, will sit on your incubating list.’
Patient experience is not linked to patient outcome	‘I'm not thinking about positive outcomes in the sense of a really positive experience for someone. What I'm thinking about is achieving the correct outcome for that patient.’
Patient safety is important due to bottom line	‘I think staff culture comes last. So, safety for staff comes last and I think safety for the patients is prioritised because of revenue.’ ‘I think because of revenue and also wanting to provide a good service as well’
Practice facilities impacts safety culture	‘And I think that's the thing that makes a big difference to me is in a hospital, I can always go and find professional, skilled help and I think you can do that in

Code	Example
	a small animal hospital. But that's really hard when you're when you, when you're working by yourself.’
	‘Different facilities available to you and again and that, and I'm not saying it's right or it's wrong, because I do think there are times where we go, oh, we haven't got the facilities stuff it I'm going to do it. And that isn't the right attitude, necessarily, but it will alter your approach and how you do things and what you're happy to do as well.’
Safety culture measures adversely impact the bottom line	‘Practice as well, so maybe some of the smaller practices. Don't, aren't, as I mean, there are things that actually like checklists. I mean, that's free. There should be no excuse. But you know, maybe some of the health and safety falls a bit short because they haven't got the money to send people off to do the courses.’
	‘There's always a balance and a payoff between actually, what practices can afford in terms of time and resource and what is required.’

Code	Example
	‘So a safety critical should promote better outcomes, less risk, but it will not be as financially lucrative that that's the that's the thing you have to accept. If you go for a safety critical approach, you will not be as financially lucrative because it encourages you to not to cut corners and it does not encourage you to be risky in terms of your behaviour. Financially lucrative usually comes from more risky behaviour.’
Safety is not the top priority thus not a safety critical industry	‘I still feel in today's society, it's (safety culture) not the top priority.’
Staffing levels impact safety culture	‘A lot of people at the moment that are tired, overworked, which then have an impact on these two. Lack of staff, lack of permanent staff and having locums in that don't know people's safety culture or don't care because they're not there all the time.’
	‘So yes, I do think it's important when you look at the current state of the profession and the problems with workforce and attrition. Actually, if we could create a culture where mistakes were minimised and people felt more sort of supported, then maybe that wouldn't be such a problem.’

Code	Example
The attitude of 'giving it ago' is contrary to a positive safety culture	‘You have to assume that they're (animals) sentient. You gotta give them some benefit there. You can't just use them as an oh, I'm a ******* guy and then oh, ****, can't walk anymore. Oh, well, never mind. We'll just chop his leg off, that's *******. That's not OK, that's just not OK.’ ‘I have heard stories of people. Having a go at things and then it goes wrong’ ‘This animal doesn't have long left and we should let it go in nicely. Rather than me having a go at something, it all going ****** and then the animal having a ******* horrific last 24 hours of its life. So yeah, I'm really not a fan of having a go.’
Welfare of animal should guide decision making	‘It's got to be an important part of any healthcare. Because you can't be doing the best for animal welfare or patient welfare if you're not practising in a safe culture where mistakes are more likely to happen.’ ‘Did anybody get hurt that day? I don't think so. But ultimately, we're talking about the welfare of an animal.’

Table 11 - Theme 3 - control

Code	Example
Alone working hampers safety culture	‘Even when you can say, well, actually I just need to walk away from this for 10 minutes. We need to regroup, reassess the situation and then tackle it again. That's really hard when you're by yourself working, working alone.’
Confidence needed to have a good safety culture	‘So I remember as 18 months out grad going to go and do a TB test and it wasn't safe handling and it wasn't till the bull jumped over me that I turned and said I'm done and I'm walking off. I should have called it half an hour an hour before. I wouldn't do it now. Yeah, that was experience. And confidence to turn around and say, Nah, I'm good. This isn't gonna work. Ring me when you've got a proper crush.’
Cultural background impacts views on safety culture and presents challenges	‘Communication…That can be interesting, especially with certain cultural circumstances. They can be people who are being assertive can be misconstrued as somebody who is rude. Or too challenging.’ ‘So most people in the higher hierarchical positions speaking derogatory to people in lower, hierarchical positions in my experience have not trained in the UK. That is what I've noticed particularly is that if you've trained in a different

Code	Example
	country. You sometimes…there definitely seems to be a culture coming from those countries.'
Difference between types of practice makes one-size fits all approach difficult	'There is quite a big disparity. You know, I think that if in a small animal practice, more of your cases are going to come into an environment that you can control, you've got a better system by which you know emergencies are going to be triaged to say that you and by and large, you know the animals are easy. I know most people have a car. They can bring them into you.'
	'You can't necessarily take it as a one size fits all.'
	'It's very difficult to draw, you know, steadfast comparisons between farm and small. Well, in the mornings you'd be talking to an RVN who's paid to do that job. With you in farm, you would be talking to the farmer who is paying you to do that job and think you're an incompetent idiot.'
Difference definition of harm	'There hasn't been, you know, the cow hasn't suffered.'
Differences in what is considered best	'I think I think best practice to that can mean here a lot of things to different people. So if you speak to scientists and if you look at people who are looking

Code	Example
	at the evidence, they will just say that this is going to be the best practice we should be doing things like that and that's sometimes difficult if you don't look into... The circumstances.'
Difficulty implementing safety culture measures	'It's not very easy to put in practice... That's basically what I think. And you know what I see, it's really, really quite difficult.'
	'So this would be quite difficult I think'
Enforcement difficult for staff who are not regularly employed, i.e. contractors or locums	'You're always accountable to someone like if you work there.'
	'Then I felt like I can't really enforce this. Because it's her horse and she thinks she knows.
Fear of legal action drives attitudes to safety	'People are quite quick to complain, quite quick to sue if something goes wrong.'
	I think it's (safety culture) probably getting better because I think they're more aware of what they can sue. I think it's really scary.'
	'Because it is more enforceable, like legally.'

Code	Example
Framework missing	‘We don't tend to do that…That's not something I've ever done.’
Friendly does not equate to a positive safety culture	‘You could have a really friendly practice, but actually they could have actually have a negative or bad safety culture.’
Generational and age related difference in attitudes	‘Have you ever met a vet that's been practising for 50 odd years and thinks that they know absolutely best. They might not think it's necessary. They might think I should get on with our job.’
Importance of individuals working together	‘Some clinics are absolutely on it in terms of even, like doing handovers and making sure that every little detail is up to date and everyone is, even like me as a placement student, happy and taken care of’ ‘There was no communication because instead of instead of saying look, I'm struggling to hold the cats, can we stop or think about something else?’ ‘Having that ability to talk to somebody and know that you've got support, I would append above and practice. I'm a talker so I used to ring people between all my calls and chat away about stuff. But you learn a hell of a lot that way you know,

Code	Example
	you might say I did this and this nearly happened and somebody might go, yeah. Actually, don't do that. Do this instead.'
Importance of not becoming complacent	'Just because you've done 1,000,001 cat castrates doesn't mean that you're not gonna take equal care with each one.'
Individual behaviour impacts psychological safety	'Like peer pressure, if for example, you're supposed to wear goggles but no one wears goggles and then you put the goggles on and people are like, why wearing goggles?'
	'People do not speak to each other in an assertive but polite manner. Most people are slightly aggressive.'
Lack of accountability as a student	'I feel like because you're not accountable. That the safety culture is not less important, but it's less noticeable.'
Lack of enforceability impacts extent of accountability and effectiveness of safety culture measures	'Then I felt like I can't really enforce this. Because it's her horse and she thinks she knows best.'

Code	Example
	‘There's lots of recommend by our RCVS. There's lots by BSAVA but I don't think enough places are encouraged to follow them or do follow them. Like nationally. So the RCVS is not saying you must follow these, as the big. parent group. So people, they pick and choose what to follow.
Lack of respect for safety calls	‘So I think there is a need for us to perhaps take that responsibility a bit more, but also feel confident in exercising any change that might need to be made and know that we're going to be supported by others within the practice and within the profession if we make those calls.’
	Can I do this TB test through this rickety old crush? No, I can't. What a disaster, then, if I turn around and say, well, don't worry, farmer, because I will. I'm sorry about my, you know, pathetic assistant.’
Leadership needed to drive safety culture	‘It very much depends who is your leader. What's the leadership you type, what type of leadership you have, what type of people you work with, and how confident they are in themselves.’
	‘Leadership, I think. It depends on how you do the leadership.’

Code	Example
Limited influence over the environment when visiting farms and yards	‘If the horse is stuck in a fence, then you know you've got to go to that particular patient.’
	‘I'm mainly based in the hospital. Where I do have much more control over some of those, you know, those aspects.’
Personal ethics impacts safety culture's importance	‘Like I've looked and I've been around a lot of different practices and there's things that you know has been completely commonplace in one practice and when I've done it in another practice, they're absolutely horrified and they're like, what are you doing?’
Reliant on individuals	‘Well, everyone's common sense is different.’
	‘…just always boils down to that one individual.’
Reliant on non-qualified individuals	‘Again, the other person you'd ask to do it is the farmer.’
	‘…quite often the farmers do the jabbing for us. It's looking at what you've just done. And saying right, which is a bit that we messed up.’

Code	Example
Safety culture is practice dependent	‘It definitely depends on the practice.’ ‘Where one of the things that would be considered very important is that you wear appropriate PPE, and I've also worked places where that's been really loud on the priority list and I think that if it's made very clear to you that you're expected to turn up and you’re supposed have this PPE and you're supposed to wear it here and you're supposed to do this here and you do not enter this area without this or you do not go into.’ ‘I think that the just element of it completely depends on the practice.’
Safety culture is related to individual contextual factors	‘I think there are perhaps slightly different attitudes in different species, in different types of practice, possibly in different regions. I think there's very different attitudes towards safety.’ ‘They're very different working environments. And even if you think of some of the things that an ambulatory vet, will have compared to a hospital, equine vets.’
Someone else’s responsibility	‘I don't have a problem, so why should I change?’

Code	Example
	‘You're right at the bottom of that chain and then there are people, and I have worked with people who go well, it's not my job. I'm not getting paid to do that. So why should I?
	‘They don't have a problem cause it's always left to somebody else.’
	‘As an individual, people fail because it's not their problem.’
Variability in communication reduces effectiveness of safety culture	‘And communication again is very variable I think.’
Variability in owners affects safety of them, vet and animal	‘That the person that's there to help you is the niece of the actual owner or isn't even the owner at all because the owner's on holiday. So that makes it more difficult and I think that practices can do things to train their clients to be better and to set some expectations of what you know is needed.’

Table 12 - Theme 4 – risk

Code	Example
Equine and farm practice are more risky	‘If anything, I think they (horses) contribute to unsafety in the workplace.’ ‘I think that the particularly on the equine side, you know we if we genuinely thought as a profession that we want to do everything that we could to mitigate risk, I think the model where people go out on visits in the middle of the night by themselves wouldn't, you know, wouldn't be a model that would be supported.’
Greater risks taken to ensure patient safety	‘You know I've lifted a 45kg dog on my own and carried it. And I know it's potentially bad for my back, but I do it anyway, so I think we are in our heads better at prioritising patient safety.’
Risky and unsafe situations viewed as a challenge	‘I suppose it kind of becomes part of the fun. Yeah, of being an equine vet that you never know what you're going to be faced with. And you have to kind of adapt. And it becomes sort of, you know, a bit of a fun, bit of the job.’
Safety culture mitigates against risks	‘It's about reducing risk. It's not about making people have a nice experience.’

Code	Example
Staff safety not prioritised despite considerable risk	‘I think we do run the risk of becoming quite blasé about physical risk. ‘When I was training, which sadly, was over a decade ago now, was almost frowned upon. Like, if you like, you're putting yourself above your patient’s kind of mantra.’
Unpredictable nature of job must be accepted	‘It is risky all the time and you just have to do it so you just become immune to risk.’ ‘The risk is higher when you don't know that the risk is there.’ ‘That you would have to help mitigate some of the risks. You know, we still get called to places that have no electricity, no light, that you have to climb over the gate.’ ‘You know, you see it down at the farm where the staff have ended up being beaten up by the cows, and I think... Perhaps your guard drops a bit.’