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Safety Culture Framework for Nursing and Care Institutions

Jaana Sepp

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Declaration:
Hereby I declare that this doctoral thesis, my original investigation and achievement, submitted for the doctoral degree at Tallinn University of Technology, has not been previously submitted for doctoral or equivalent academic degree.

Jaana Sepp

Signature

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Contents

List of publications

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I Sepp, J. (2018). Development of a reciprocal health care model for determination of safety level in the nursing homes in Estonia. *European Journal of Economics and Business Studies, 4*(3), 122–130.

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III Sepp, J., Reinhold, K., Järvis, M., & Tint, P. (2018). Human factors and ergonomics in safety management in healthcare: Building new relationships. *Agronomy Research*, *16*(4), 1862−1876.

IV Sepp, J., Järvis, M., & Reinhold, K. (2019). Assessment of psychosocial risk factors and their impact on health-care workers' mental health: An empirical study in Estonian nursing homes. *Research in Economics and Business: Central and Eastern Europe, 11*(1), 17−32.

Author's contribution to the publications

Contribution to the papers in this thesis are:

I Article I: I was the main author of this article. I piloted the questionnaire, collected the data, analysed the results, and wrote the article. I also analysed the results and theory and compared them with the developed framework by combining all the topics previously addressed individually as an integrated whole.

II Article II: I was the main author of Article II. I collected the data, analysed the results, and wrote the article in collaboration with co-author Piia Tint.

III Article III: I was the main author of Article III. I developed and piloted the questionnaire, collected the data, analysed the results, and wrote the article in collaboration with co-authors Marina Järvis, Karin Reinhold, and Piia Tint.

IV Article IV: I was the main author of the article. I piloted the questionnaire, collected the data, analysed the results, and wrote the article in collaboration with co-authors Marina Järvis and Karin Reinhold.

Introduction

Up to half of deaths from COVID-19 were among residents in long-term care facilities and nursing homes (Comas-Herrera et al., 2020). The pandemic is an example that clearly underlines the need for rigorous efforts dedicated to the long-term care of elderly people (Scheil-Adlung, 2015; Spasova et al., 2018), new innovative management principles, and the well-planned allocation of resources (Balia & Brau, 2014). It has previously been noted that developing new models for multidisciplinary healthcare and better cooperation for health and social care workers is necessary (Minayo Gomez, Vasconcellos, & Machado, 2018; Purdy, 2010; Ribeiro, Marziale, Martins, Galdino, & Ribeiro, 2018). The cross-use of employees across these systems is a common experience in this sector and, for these organisations, it is important that employees have similar values, which are expressed in the organisational culture. Kohn, Corrigan, and Donaldson (2000), in their book *To err is human: Building a safer health system*, identified safety culture as a key element in providing quality healthcare and patient safety (see also Ree & Wiig, 2019). In my research, I define a patient (the term used in healthcare) or a client (the term used in social services) as a resident who needs some level of support in activities of daily living (ADL) and who lives in a healthcare or social service institution (hereinafter care institution*)* because their degree of physical or cognitive capacity is reduced (Balia & Brau, 2014).

Safety culture is defined as "*the product of individual and group values, attitudes, perceptions, competences and patterns of behaviour and determine the commitment to, and the style and proficiency of, an organisation's health and safety management"* (Advisory Committee on the Safety of Nuclear Installations, 1993, p. 23). Safety culture can be viewed, through safety climate, as a measurable component that can be defined as "*workgroup members' shared perceptions of management and workgroup safety related policies, procedures and practices*" (Kines et al., 2011, p. 634). **The research problem** of the thesis is related to the scientific evidence that, in care institutions, patient safety culture is lower than in hospitals because of the poor management of business operations, e.g. inappropriate work organisation and an unsupportive working environment (Gartshore, Waring, & Timmons, 2017). The research problem is related to the absence of a holistic concept of safety culture for healthcare and long-term care institutions (Gartshore et al., 2017; Manser, Brösterhaus, & Hammer, 2016; Wagner et al., 2018). There is a large knowledge gap related to safety-culture issues in care institutions (Ree & Wiig, 2019); most studies have been conducted in the US (Gartshore et al., 2017), with a few some studies in Norwegian (Bondevik, Hofoss, Husebø, & Deilkås, 2016; Cappelen, Aase, Storm, Hetland, & Harris, 2016; Olsen & Bjerkan, 2017), Swedish (Danielsson, Nilsen, Öhrn, Fock, & Carlfjord, 2014), and Spanish care and nursing homes (Blanco-Donoso et al., 2021). Ree and Wiig (2019) focused on needs to identify the challenges and areas for improvement and to develop innovative intervention strategies in this context. One of the few existing models designed for healthcare, focusing on employees' and patients' safety, was proposed by Flin (2007). The model distinguishes between top managers' practices and those of unit supervisors, defines errors due to employees' unsafe behaviours, and covers both workers' and patients' causes of injuries. Previously, Reason and Hobbs (2003) proposed in their model that, in healthcare, a positive safety culture is related to three subcultures: just culture; reporting culture; and learning culture. Despite previous models' (Flin, 2007; Reason, 1997; Reason & Hobbs, 2003) ambitious efforts to cover overall safety in healthcare, these models do not provide

a deeper understanding of different proactive indicators of safety culture, such as the management of psychosocial risks and intangible assets such as human knowledge, education, and practices. Based on the previously defined research problem, I uncovered the following **research gap**; safety culture in healthcare has been investigated almost always only among nurses and medical staff (Cappelen et al., 2016; Cappelen, Harris, & Aase, 2018; Pousette, Larsman, Eklöf, & Törner, 2017; Wagner et al., 2018). Relatively little is known about care workers' perceptions regarding safety and how care institutions deal with health and safety issues (Gartshore et al., 2017; Cappelen, Harris, & Aase, 2018).

Within this context**, the aim** of my thesis is to identify potential predictors of care workers' and patients' safety and to develop a holistic framework for a positive safety culture concept from the perspective of healthcare and care institutions. From the functional perspective, it is essential to understand that ensuring a positive safety culture depends on management commitment to safety. The literature also reveals that employees' perceptions of the importance of safety in the workplace (Cappelen et al., 2018), employees' competences (Jin & Yi, 2019; Karami, Farokhzadian, & Foroughameri, 2017), safe working conditions, and psychosocial well-being are predictors of safety behaviour (Wagner et al., 2019), all of which need to be considered simultaneously. Safety management has become a major issue in all work processes, whereby safety becomes a desirable organisational value that guides and determines employees' safety behaviour. Based on the above, I defined the research questions. The main research question is: How can a positive safety culture be ensured in care institutions? As I am studying a complex phenomenon, I divided my research into sub-questions to make the research process more understandable and manageable. The narrower questions of the study are formulated as follows:

RQ1. How do care workers perceive safety culture in Estonian care institutions?

RQ2. Which aspects of the working environment influence employees' safety behaviour?

RQ3. How do care workers' professional competences influence their commitment to safety?

RQ4. How does psychosocial risk management influence employees' well-being and safety behaviour?

My thesis is based on four articles (see the List of Publications). Since the design of the current study is explanatory and attempts to provide a holistic and new understanding of positive safety culture in care institutions, an explanatory sequential study design (Fetter, Curry, & Creswell, 2013; Hurley, McHugh, Browne, Vaughan, & Normand, 2019; Othman, Steen, & Fleet, 2021) was adopted. Pragmatism, as a philosophical research paradigm, was chosen to study this complicated phenomenon (Pappas, 2017) and the methodology was developed accordingly. To achieve the research goal and answer the research questions, I categorised safety culture into subcultures and used four measurement concepts. To characterise safety climate (see Article I) as a measurable component of safety culture and a predictor of safety behaviour (Bosak, Coetsee, & Cullinane, 2013), I used the Nordic Occupational Safety Climate Questionnaire (NOSACQ-50) developed by Kines et al. (2011). Based on the results from the first study, I conducted focus-group interviews with care workers in order to investigate more deeply safety culture and aspects of the working environment that influence employees' safety behaviour. In addition, I used the Work Well-Being Questionnaire (KIVAQ) to examine respondents' well-being (see Article II). To explore the relationship between

employees' professional and safety competences, as well as commitment to safety, I developed, empirically tested, and validated the Caregivers' Competences Questionnaire (CCQ) (see Article III). I conducted a survey using the Copenhagen Psychosocial Questionnaire version II (COPSOQ-II) (Kristensen, Hannerz, Hogh, & Borg, 2005) to evaluate work-related psychosocial risk factors and well-being, as well as their relationship with mental health problems (MHPs). Additionally, I explored the impact of organisational aspects of psychosocial risk management on employees' safety behaviour (see Article IV) and proposed a conceptual framework for safety culture. The connections between the aim of this thesis, the research questions, and the published articles (Articles I–IV) is presented in Figure 1.

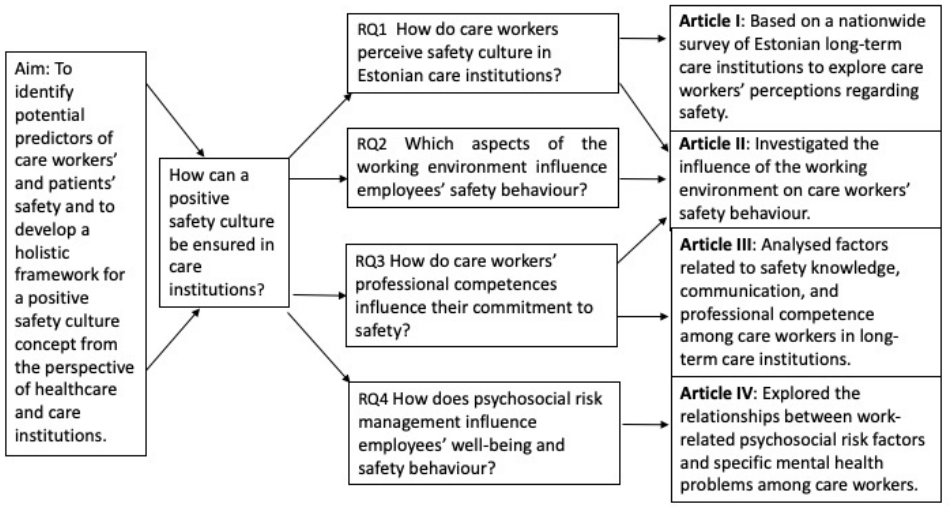

Figure 1. *Connections between the aim of this thesis, the research questions, and the published articles (Articles I–IV).*

Source: Compiled by the author.

I conducted these studies in Estonian care institutions because Estonia is a typical European country where: i) the requirements and standards of the European Union (EU) have been applied (Paat & Merilain, 2010); ii) typical challenges have been noted [e.g. formal home care services (Bulgaria, Cyprus, Estonia, Spain, Hungary, Ireland, Macedonia, Poland, Romania, Turkey)]; and iii) residential care facilities (Estonia, Croatia, Hungary, Macedonia, Poland, Romania, Turkey) for the elderly are underdeveloped (Scheil-Adlung, 2015; Spasova et al., 2018). The problems in Estonian care institutions are similar to those in other European countries: i) low levels of complex care; ii) lack of educated and experienced personnel; iii) insufficient financial resources; iv) high psychosocial risks (burnout, violence from patients, etc.); and v) high levels of occupational accidents and illnesses (Scheil-Adlung, 2015; TNS Emor & PRAXIS, 2015).

The data for these studies were collected from September 2014 to December 2017. During the first stage (Article I), a simple random sample was selected from 65 Estonian nursing homes in 2014, which at that time were registered with the Health Insurance Fund. These institutions were entitled to provide nursing services in nursing or care homes (31) or inpatient care in hospitals (34). Out of these, 19 institutions (33% of the population) met the sample criteria (offering follow-up nursing, long-term care,

rehabilitation, palliative care, and care for people with cognitive impairment) and were approached to participate. Four of the institutions declined to participate, resulting in 15 organisations in the final sample. During the second stage (Article II), a simple random sample was selected from care institutions involved in the first stage, following the same criteria. Three of the selected institutions were nursing homes and three were hospitals, in which inpatient care services were also provided. The third stage (Article III) included four institutions from the previous studies and three new ones, which were selected based on the initial criteria from the first study. The fourth stage (Article IV) of the study included four institutions from the previous studies and five new ones. The total number of investigated institutions was 23 (16 nursing homes and seven inpatient care hospitals). The first stage (Article I) included a simple random sample from 371 nurses and care workers [233 questionnaires were completed (62.8% of the sample)]. In the second stage (Article II), 73 care workers from six institutions from the first study participated. The third stage (Article III) included a sample of 362 care workers [241 questionnaires were returned (133 care workers, 108 nurses; 66.6% of the sample)] and the fourth stage (Article IV) comprised 371 nurses and care workers from a sample of 509 full-time care workers (66.8% of the sample).

The current thesis provides several novel insights within the safety and management literature. I contribute theoretically to the safety culture and management scientific literature while exploring different aspects of safety culture in care institutions and discussing the complexity of healthcare and long-term care phenomena. On one hand, there is an understanding that the priority in healthcare has always been the patient/resident and his/her safety, as well as aspects related to the provision of quality services. On the other hand, I argue that patient safety and satisfaction cannot be fully understood without also considering occupational health and safety (OHS). The focus must be on ensuring the safety both of residents and employees. The main **theoretical contribution** is based on understanding that, to ensure employee and patient safety, it is not sufficient only to develop and implement a reporting and learning culture within the organisation (Reason & Hobbs, 2003). Using a differential perspective (Reason, 1997), I add two subcultures [professional competence culture (Article III) and psychosocial well-being culture (Article IV)] as possible predictors of safety behaviour that should be assessed and developed within organisations. I propose that professional competence culture is based on understanding that employees' professional competences and the development of professional identity (PI) increase employees' commitment to safety and should be integrated, as well as supported and shared, by managerial components and by co-workers. Additionally, I propose that, through appropriate psychosocial well-being culture, organisations could prevent occupational injuries and adverse events related to patients. I characterise psychosocial well-being culture as encompassing four main domains (demands at work, work organisation and job content, interpersonal relationship and leadership, and values in the workplace) that are strongly related to employees' mental health. My research adds substantial additional knowledge to earlier findings in this field, confirming the interplay between the identified predictors of safety and safety culture. I support previous findings that assert that an appropriate safety culture can be developed in organisations in which the managerial component is committed to safety, safety is a priority (Article I) (Kalteh, Mortazavi, Mohammadi, & Mahmood, 2021; Wiig et al., 2018), the culture is blame-free, and the working environment is non-punitive (Article II) (Wagner et al., 2019).

I also **empirically contribute** to the common understanding that traces of the legacy of the Soviet Union can still be observed and may influence understanding and perception regarding health and safety, as well as safety culture (Article I). Therefore, Estonia represents an interesting context in connection with the relatively recent accession to the EU as the welfare system is still in the development phase and safety culture should be ensured on an ongoing basis. There is a need to change understanding of safety culture and the role of healthcare staff, especially care workers, regarding their awareness of the speciality and their well-being in care institutions. The findings from the study can be generalised, to a certain degree, to other countries with similar legal systems and a common history, for instance post-Soviet countries such as the Baltic countries and some other recent post-communist EU members.

I **contribute methodologically** through the tools and methods for the systematic assessment of the safety climate, care workers´ competences and psychosocial well-being, predictors of safety, and the most underdeveloped subcultures of safety culture in care institutions.

Regarding **managerial and practical implications**, I recommend developing a positive safety culture based on mutual trust and integrating a mechanism that ensures learning from mistakes (see Article II) and employees' continuing development of professional competences and identity (see Article III). The findings of this thesis reveal that the awareness of safety in all investigated care institutions is inconsistent and should be improved, as well as brought into line with international standards (see Articles I and II). I propose developing a curriculum for care workers' professional-standard requirements and integrating safety knowledge into the competence model for care workers (see Article III). Additionally, employees´ mental health should be protected, and proactive psychosocial risk management implemented (see Article IV). In order to ensure a positive safety culture in care institutions, I present an evaluation package that helps operations managers to collect systematic feedback. According to collected data, work and safety activities can be organised and procedures and training programmes can be designed that enable the promotion of employees' safety behaviour and safe performance.

In line with the brief introduction presented above, this thesis is designed to be considered as a single study combining the four previous papers (Articles I–IV), which represent four original scientific publications that deal with the research questions and in which the key concepts are outlined.

This thesis is divided into three five main chapters. Chapter 1 provides an overview of the theoretical framework, focusing on safety science theory and safety culture models, and discussing existing relevant knowledge on safety culture and the measurement of the safety climate in healthcare. Chapter 2 provides an overview of the research design and methodological choices. Chapter 3 presents the main results and the applications that have been analysed and discussed based on the theoretical background presented in Chapter 1. The results are discussed in detail in Chapter 4. In Chapter 5, suggestions for future research on safety culture in care institutions are proposed and the study's limitations are discussed.

Abbreviations

ADL	Activities of daily living
CCQ	Caregivers' Competences Questionnaire
COPSOQ-II	Copenhagen Psychosocial Questionnaire version II
COVID-19	Coronavirus disease (SARS-CoV (2019-nCoV) coronavirus)
EU	European Union
IOM	Institute of Medicine
KIVAQ	Work Well-Being Questionnaire
MHPs	Mental health problems
NHS	National Health Service (UK)
NOSACQ-50	Nordic Occupational Safety Climate Questionnaire
OHS	Occupational health and safety
PI	Professional identity
SMS	Safety management system
SPSS	Statistical Package for Social Sciences (software package)
WHO	World Health Organization

Terms

Adverse event	An injury caused by medical (mis)management rather than the underlying condition of the patient (Kohn et al., 2000).
Blame-free culture	An opportunity to learn and develop, as well as prevent errors, without fear of punishment related to performance (Giannetti, 2003; Runciman, Merry, & Tito, 2003).
Error	The failure of a planned action to be completed as intended or the use of a wrong plan achieve an aim: a) error of execution (the correct action does not proceed as intended) or b) error of planning (the original intended action is not correct) (Kohn et al., 2000).
Hazard	A circumstance, agent, or action with the potential to cause harm (World Health Organization, 2009).
Just culture	A culture of trust, in which what is allowed and not allowed is defined, for which fairness and responsibility are critical (Ulrich & Kear, 2014).
Leading indicators	The components that prevent errors, accidents, injuries, near-misses, etc.
Mistakes	Rule-based errors that usually occur during problem solving when a wrong rule is chosen (Kohn et al., 2000).
Nursing care institution	A healthcare institution that provides inpatient beds or resident beds and nursing services to persons who need continuous nursing services but who do not require hospital care or direct daily care from a physician (https://www.lawinsider.com/).
Preventable adverse event	An adverse event attributable to error is preventable. A succession of errors can lead an adverse event (Kohn et al., 2000).
Proactive approach	The systems to identify and register errors in healthcare institutions, based on the paradigm that considers that these errors are mostly system-based, that complete elimination is impossible, and that they are caused by careless actions (Kohn et al., 2000).
Professional competence culture	The organisational capacity to value and use all opportunities from formal education systems and in-service safety training programmes to provide a life-long learning process within and outside the organisation.
Professional competences	Consists of different competences based on general competence, such as a coherent set of knowledge, skills, and attitudes that can be used in the context of job performance (Wald, 2015).
Professional identity (PI)	Deep commitment to the values and dispositions of the profession, related to “hearts and minds” and that is fundamentally ethical (including an ethic of caring), through the development of a set of internal standards or an “internal compass” regulating professionals’ work (Wald, 2015).
Psychosocial well-being culture	Supports employees’ mental health and well-being through quality leadership, adequate work demands, appropriate work organisation, and supportive interpersonal relationships between colleagues as well as between employees and supervisors.

Risk	A situation or event where something of human value (including humans themselves) is at stake and where the outcome is uncertain (Rosa, 1998).
Safety	The absence of accidents, whereby an accident is defined as an event involving an unplanned and unacceptable loss (Leveson, 2004).
Safety behaviour	Refers to the extent to which employees ignore safety regulations to get the job done, carry out forbidden activities, and perform their duties incorrectly (Rundmo & Hale, 2003).
Safety climate	Defined as workgroup members' shared perceptions of management and workgroup safety-related policies, procedures, and practices (Kines et al., 2011).
Safety culture	The share and learning of the meanings, experiences, and interpretation of work and safety (expressed partially symbolically) that guides people's actions in relation to risk, accidents, and their prevention (Richter & Koch, 2004).
Slip	Occurs when there is a break in the routine while attention is diverted; errors occur because of lack of a timely attentional check (Kohn et al., 2000).

1 Theoretical framework of the research

1.1 Safety culture in the context of safety science theory

Safety science has been defined as an inter- and multidisciplinary science with comprehensive theoretical foundations, encompassing engineering, psychology, sociology, management, leadership, and organisational and individual behaviour (Aven, 2014; Pillay, 2016; Swuste et al., 2020). Theory in safety sciences is contextual, and can be developed through an evidence-based practice paradigm in which empirical research is the "evidence", leading to the transference of knowledge into possible practice through knowledge building based on scientific outputs (Aven, 2014; Klockner & Pillay, 2019). The domino model (Heinrich, 1931) describes safety through sequential and unambiguous relationships between causes and effects. Safety culture is a subculture of organisational culture; it can be defined as the prior cause of behaviour, simplified as "*the way we do things around here*" (Schulman, 2020, p. 3). Cultural theory has strongly influenced classical approaches to organisational efficacy and performance and is a relevant organisational and management issue (Schein, 1990). Various theoretical approaches and methods have been used to characterise the phenomena of safety culture (Filho & Waterson, 2018; Le Coze, 2016). To obtain a deeper understanding of the phenomenon of safety culture, a holistic approach and analyses of different levels is required, from the manifestation and discursive to the epistemological level where culture is considered a precondition for knowledge (Haukelid, 2008; Klockner & Pillay, 2019). The ontological distinction limits the complexity of the safety phenomenon to personal and institutional knowledge, where jointly developed knowledge is the result of group and informal learning (DiMaggio & Powell, 1983). The ontological status expresses the constructability of the phenomenon, to its stabilisation, and how this network maintains its existence in practice (Haavik, 2014). Anthropologists see safety culture as a source for power, politics, and business, which can be historically situated and continually produced through competing sets of interests (Keesing, 1994). Geertz (1973) defined culture as a prerequisite for action and thought, which can be historical, while, according to Bloch (1998), culture is formed through experience and tacit knowledge.

Guldenmund (2010, 2016) presented safety culture, as the conceptual analysis of sociological paradigms (Burrell & Morgan, 1979), in terms of three approaches: i) an interpretative or anthropological approach; ii) an analytical or psychological approach; and iii) a pragmatic or experience-based approach. The interpretative or anthropological approach describes the meanings and symbols of persons involved in social processes in groups. This approach is used to specify evidence for underlying cultural assumptions and includes complicated scientific measurement aspects, which can be assessed through narratives, case studies, document analysis, interviews, and observations (Scott, Mannion, Davies, & Martin, 2003a). The analytical or psychological approach sees safety culture as a common attitude, which can be specified by the assessment of safety culture and safety climate using statistical and psychometric instruments (Guldenmund, 2010, 2016). The pragmatic or experience-based approach focuses on the processes of the organisation's structural dynamics and its influences on safety culture. Silbey (2009) described safety culture through three main "lenses": "culture as causal attitude"; "culture as engineered organisation"; and "culture as emergent and indeterminate". The measurable components (values, competences, attitudes, and behaviours concerning safety that exist within organisations) are reflected

in the "culture as causal attitude" dimension. The processes and practices related to safety improvement, reliability, and resilience are associated with the "culture as engineered organisation" dimension, as well as social context, and this is mediated by artefacts and material, both mental and representational, through the third dimension, "culture as emergent and indeterminate" (Gherardi & Nicolini, 2000). Based on the theory developed by Martin (1992), safety culture can be viewed from three cultural perspectives: integration; differentiation; and fragmentation (Table 1). The research related to the integration perspective is related to cultural manifestations and shared understandings. The differentiation perspective focuses on subcultures and understanding between the interpretations and meanings. The fragmentation perspective is related to ambiguity, whereby cultural manifestations are ambiguous and poor clarity exists between interpretations and meanings (Richter & Koch, 2004).

Table 1. *Commonalities and differences in organisational culture.*

Cultural perspective	Description
Integrated	Integrated cultures occur when there is wide consensus on the basic beliefs and appropriateness of behaviours within the organisation. Although often assumed, such integration may exist only in broad aggregate or may be more wishful thinking than practically realised.
Differentiated	Differentiated cultures occur when multiple groups within an organisation possess diverse and often incompatible views and norms. The development of subcultures, misunderstandings, and conflicts is then to be expected. The NHS has long existed as a collection of loosely coupled differentiated cultures (medical, nursing, professions allied to medicine, administrative and, more recently, managerial groups).
Fragmented	At the most extreme, differentiated cultures may diverge and fragment to such an extent that cross-organisational consensus and norms are absent. Even within specific groups, differences may be more marked than commonality, and agreements that are seen may be only fleeting and tied to specific issues. Thus, the organisation is characterised by shifting alliances and allegiances, considerable uncertainty and ambiguity, and unpredictability.
Note: This typology is not intended to suggest that organisations have cultures that are either integrated, differentiated, or fragmented. Instead, each of these views may be applied to the same organisation to reveal, rather than revealing an overall lack of coherence.	

Source: Adapted from Davis, Nutley, & Mannion (2000).

There is still much debate regarding the theoretical and empirical aspects of safety science and safety culture, representing an occupational identity crisis, and there is no consensus or joint understanding on how to define and assess safety culture (Filho & Waterson, 2018; Le Coze, 2016). In this thesis, I investigate the interaction between managerial and human factors and its impact on safety performance (Richter & Koch, 2004). I use the term "safety culture" to describe tacit knowledge exchange between

interpretive (personal knowledge, e.g. employees' perceptions of safety management, occupational competences, and the management of psychosocial risks) and functional (institutional knowledge, e.g. awareness of employees' performance and perceptions of patient safety within the unit and organisation) perspectives. Researchers use two broad frameworks for investigating subcultures within the organisation: (a) subcultures related to special or dominant organisational values (Martin & Seihl, 1983); and (b) acknowledging the subcultures related to occupational, unit, speciality, clinical network and other affiliations (Scott, Mannion, Davies, & Marshall, 2003b). I differentiate safety culture through subcultures and describe the influencing elements and components in order to develop a clear understanding of the interpretation and the meanings of safety culture. This should support managers in forming institutional knowledge and a holistic understanding of safety, a safe working environment, and achieving organisations' objectives in this context. In the next subsection, different safety culture models and the scientific empirical practices of the field will be presented and compared, and the choices according to which a new conceptual framework for care institutions' safety culture should be developed will be discussed.

1.2 Safety culture models and safety climate

The most known safety culture models have been in the fields of engineering, oil, and industry (Filho & Waterson, 2018). The "three E's" model developed by the National Safety Council (1974) included the following factors: engineering; education; and enforcement. According to this approach, the engineering and enforcement components are classified as separate domains. Education has been classified as a unit, between defined components, as education can be related both to engineering and enforcement (National Safety Council, 1974). In industry, since the 1990s, psycho-social dimensions, as a product of human factors, have been the focus of attention, leading to the development of Geller's (1994) "Total Safety Culture Model", Cooper's (2000) "Reciprocal Safety Culture Model", Reniers, Cramer, and Buytaert's (2011) "P2Y Model", and Vierendeels, Reniers, van Nunen, and Ponnet's (2018) "The Egg Aggregated Model (TEAM)" (see Table 2).

Table 2. *Safety culture models and components*.

Model	Component I	Component II	Component III
Total Safety Culture Model (Geller, 1994)	Environment	Behaviour	Person
Reciprocal Safety Culture Model (Cooper, 2000)	Situation	Behaviour	Person
P2Y Model (Reniers et al., 2011)	Technology	Procedures	People
The Egg Aggregated Model (Vierendeels et al., 2018)	Technological domain	Organisational domain	Human domain

Source: Author.

Geller's (1994) Total Safety Culture Model includes environment, behaviour, and person factors. Cooper's (2000) Reciprocal Safety Culture Model focuses on situation, people, and behaviour. The P2Y model developed by Reniers et al. (2011) highlights people, procedures, technology factors, and positioning training between them. Vierendeels et al.

(2018) incorporated in their model all aspects of safety science, incorporating Geller's (1994), Cooper's (2000), and Reniers et al.'s (2011) models into one concept, which includes technological, human, and organisational domains. The human domain includes psychological factors, which influence individual motivation according to knowledge, skills, ability, attitudes, and personal characteristics as individual risk perceptions. The technological domain refers to observable factors, such as injury rates and reporting, and relates to people's technology, procedures, and behaviour, as well as training aspects. The organisational domain, as a perceptual factor, includes safety climate as a perception of safety and depends on leadership, management commitment, trust in the organisation, and communication transparency. All domains are interrelated and should be measured. Finally, The Egg Aggregated Model includes domains and factors previously proposed by other authors (Vierendeels et al., 2018).

Another way to describe safety culture is based on the concept of the maturity model (Filho & Waterson, 2018). Maturity models describe essential aspects or key attributes that characterise an organisation at a particular level and define the stages used to assess organisations or processes via different sets of multi-dimensional criteria (Becker, Knackstedt, & Poeppelbuss, 2009; Wendler, 2012). Safety culture in organisations can be seen through the stages in the progress sequentially (Fleming, 2001), from unsafe cultures ("pathological" and "bureaucratic" organisations) to proactive culture ("generative" organisations) (Hudson, 2007).

According to Reason's (1997) safety culture model, organisational accidents can be minimised if organisations incorporate three safety-related systems: the person; the organisation; and the engineering. Reason's (1997) systems are based on the areas of: organisational and management factors; human–system integration; and human reliability. This author asserted that each system is dynamic, with each reciprocally influencing the others. The person system includes individual safety performance and perceptions. The organisation system includes factors related to management structure and organisation; it is influenced by societal, regulatory, and cultural aspects. The engineering system includes components related to the safety management systems (SMSs) in addition to the human systems. Organisations considering safety according to this model focus on fixing the system before addressing human behaviour. Additionally, Reason (1997, pp. 195–196) described safety culture as being a combination of five subcultures:

1 *Informed culture,* defined as one in which "*those who manage and operate the system have current knowledge about the human, technical, organisational and environmental factors that determine the safety of the system as a whole*". An effective safety information system is the foundation of an informed culture.
2 *Reporting culture*, defined as one in which employees are prepared to report critical incidents, errors, and near-misses, particularly their own, in a climate of trust and without fear of reprisals. Those who provide these reports must be assured that confidentiality will be maintained and that the information submitted will be acted upon.
3 *Just culture,* defined as one in which employees understand the delineation between unacceptable and acceptable behaviours. Those who carry out unacceptable behaviours will be punished by way of disciplinary action.
4 *Flexible culture*, defined as one in which the organisation has the ability to reconfigure itself in the face of high-risk operations or certain kinds of emergency.

This flexibility enables the organisation to transfer control to "*task experts in a crisis*", regardless of the hierarchical nature of the organisation.

5 *Learning culture*, defined as one in which "*the organisation has the willingness and ability to understand and make changes based on safety information provided internally within the organisation and externally across the organisational interface. Among the key elements of this subculture – observing, reflecting, creating and acting – acting is the most difficult element to carry out successfully*".

I follow the ideas underpinning Reason's (1997) approach and idea of the differentiation of subcultures in order to further understanding regarding the interpretations and meanings of safety culture. This approach does not include aspects related to disciplinary processes, safety communication, or finance questions, which are the main deficiencies of Reason's (1997) safety culture model.

Debates surrounding measuring safety culture have been ongoing since the phenomena achieved popularity after the International Nuclear Safety Advisory Group (1986) published a report regarding the Chernobyl "accident". Schein (1990) determined that, by assessing the safety climate as an employee's perceptions and beliefs regarding safety, the measurement of safety culture is possible. Zohar (1980) defined a safety climate as a summary of shared employees' perceptions regarding their work environment. Denison (1996) proposed that safety culture should be measured both by qualitative and quantitative methods, whereas safety climate can be measured only by questionnaires, which could not represent all aspects of safety culture. Safety climate is most commonly assessed by safety climate questionnaires to measure employees' attitudes and perceptions regarding safety, as they are practical to apply in terms of time and cost-effectiveness (Filho & Waterson, 2018; Guldenmund, 2000; Pidgeon, 1998; Schulman, 2020). Currently, there are still forward-looking objectives based on leading indicators that could help to increase the occupational safety level of institutions (Sinelnikov, Inouye, & Kerper, 2015) and enhance patient safety and patient outcomes (DiCuccio, 2015; Taylor et al., 2012; Wagner et al., 2018). The previously discussed models were oriented toward industry, engineering, and other fields, and their aim was to highlight safety issues within organisations, protect employees' health and safety, and to minimise safety-related costs. However, in healthcare, the approach toward safety is dominated by the patient-safety perspective. Therefore, in the next section, the specific models for the healthcare sector will be presented.

1.3 Safety culture and safety climate in healthcare and care institutions

In healthcare, the approach of patient safety culture has been widely used, which is oriented toward patient safety and supported by mutual trust, based on open communication, shared perceptions of the priority of safety, and belief in the efficacy of preventive measures (Cappelen et al., 2016; Ulrich & Kear, 2014). The focus on proactive safety aspects has led researchers and experts to understand that adverse events can be prevented by designing systems that support people to do things correctly and that, by using the correct approach, making mistakes can be made more difficult (Kohn et al., 2000). Patient safety culture has been defined as a "*the values shared among organization members about what is important, their beliefs about how things operate in the organization, and the interaction of these with work unit and organizational structures and systems, which together produce behavioural norms in the organization that promote safety*" (Singer, Lin, Falwell, Gaba, & Baker, 2009, p. 400). Flin (2007) proposed the safety climate model for healthcare organisations with a particular focus

both on employees' and patients' injuries. The proposed conceptual model is consistent with Zohar and Luria (2005), describing the safety climate as a multidimensional construct involving interaction between senior managers and group supervisors. The model is in line with previous understanding that safety science constructs should take into account the aspects of social sciences and human factors (e.g. the systems approach) as a theoretical basis to predict the behaviour and level of safety (Sutton & Staw, 1995). According to Flin's (2007) framework, employees' motivation is a product of the safety climate. The model depicts errors as a consequence of workers' unsafe behaviours and as a predisposing factor both for workers' and patients' injuries. Flin (2007) demonstrated that employees' safety-related knowledge and motivation is the link between safety climate and safety performance. The inclusion of personal motivation in the context of safety climate and injury supports previous findings by Neal, Griffin, and Hart (2000). Flin's (2007) model includes the human component and reflects that, in the healthcare system, both individual and systemic factors are involved in patients' and workers' injuries. This author additionally acknowledged that work behaviours are influenced by different motivating factors, which may increase adverse events related to patients and cause employee injuries. Based on this, I came to the understanding that safety culture should be oriented both in relation to patients' and employees' safety, and that a new holistic framework should address aspects related both to incidents and to accident prevention.

Employees' choices and behaviour depend on the situation, their values, and the psychosocial influences of the working environment (McHugh et al., 2016; Riquelme-Galindo & Lillo-Crespo, 2021). These common elements indicate the psychological aspect of safety culture. This aspect refers to the highly related concept of safety climate. It thus appears imperative to study organisational and social-psychological conditions and processes that support or hinder the development of good safety-related climates as well as participative safety behaviours in healthcare (Wagner et al., 2019). Since safety climate is formed through shared interpretations of how safety should be valued and enacted, based on perceptions of events, behaviours, and processes within the organisation, detailed descriptions of such situations are a suitable source of information in this type of research. Dollard and McTernan (2011) suggested a multilevel theoretical model called "Psychosocial Safety Climate", which refers to a climate for psychological safety and health, integrating the following four components: i) management commitment; ii) the priority management gives to psychological health and safety; iii) organisational communication, and the extent of participation; and iv) employees' and employers' involvement in health and safety activities. Similarly, participative safety behaviour has been shown to be dependent on contextual factors within the organisation (Hofmann & Mark, 2006), and different aspects of leadership have been found to motivate compliant and participative safety behaviour (Griffin & Hu, 2013). More in-depth knowledge of the type of conditions supporting participative behaviour is therefore required (Eklöf, Törner, & Pousette, 2014).

Employees' behaviour is partly influenced by the prevailing cultural norms in their workgroup and organisation. Therefore, effective interventions for behavioural change need to be designed considering these cultural factors (Nieva & Sorra, 2003). According to the presented overview, safety culture is primarily associated with continuous improvement processes (Filho & Waterson, 2018), proactive safety management, and accident prevention, which depend on many organisational factors. The most influential factors are management commitment to safety (Almost et al., 2018; Dollard & McTernan,

2011; Huang & Liang, 2013), justice (Cappelen et al., 2016; Sammer, Lykens, Singh, Mains, & Lackan, 2010; Titlestad, Haugstvedt, Igland, & Graue, 2018), learning (Almost et al, 2018; Fyhr, Ternov, & Ek, 2017), reporting (Cappelen et al., 2016; Halligan & Zeveivic, 2011), leadership (Fyhr, Ternov, & Ek, 2017; Sammer et al., 2010; Titlestad et al., 2018), open communication (Dollard & McTernan, 2011; Halligan & Zeveivic, 2011), teamwork (Halligan & Zeveivic, 2011; Titlestad et al., 2018), and the patient-centred approach (Cappelen et al., 2016; Dollard & McTernan, 2011). In healthcare, all these factors are related to employees' safety and safety behaviour as well as to patient safety outcomes. The factors can be grouped into subcultural contexts, such as learning culture, just culture, and reporting culture (Reason & Hobbs, 2003) as well as seven main factors: leadership; teamwork; evidence-based care; communication; learning; just; and patient-centred (Sammer et al., 2010).

Based on Flin's (2007) model, in which employees' safety performance depends on safety-related knowledge, I propose that employees' commitment to safety depends on their professional competences. I suggest that, in order to encourage employees' safety behaviour and commitment to safety, employers should create a culture in which the development of employees' professional competences and identity is a part of everyday life. In addition, such culture should be shared and supported by supervisors and colleagues, and competence should be seen as a valuable asset and part of life-long learning, with the organisation supporting employees in this continuous process.

Following Dollard and McTernan's (2011) and Wagner et al.'s (2019) principles, I agree that employees' psychosocial well-being should be prioritised and ensured. As the development of employees' psychosocial well-being requires a systematic approach, I argue that it should be acknowledged and managed as a part of safety culture. Psychosocial well-being culture is related to psychosocial risk management, management safety priority and ability, as well as the patient-centred approach and its integration into all operations and activities.

In the following subsections, I present the main subcultures (just, reporting, and learning) previously defined by Reason and Hobbs (2003). These subcultures are closely related to patients' safety outcomes and employees' safety performance. Additionally, I present the main arguments for why professional competence culture and psychosocial well-being culture should also be developed both in care institutions and healthcare organisations. These new subcultures can be seen as predictors of employees' safety behaviour in the context of a supplemented positive safety culture framework.

1.3.1 Just, reporting, and learning subcultures

According to the Koch et al. (2000, p. 179) "*improving patient safety requires fixing the system, not fixing blame*". Healthcare institutions should develop "a just culture" and find the balance between punishment and blamelessness behaviour. A just culture includes the concept of continuous improvements based on open communication and an adequate reporting environment, with the opportunity to learn from errors (Reason, 1998). A just culture focuses on establishing a system centred on management behaviour in the context of employees making errors and mistakes. Additionally, employees are involved actively in health and safety activities (Marx, 2001, 2008). Organisations themselves cannot be blame-free, but an organisation should create a working environment and establish a just culture so that employees feel safe and management is committed to safety, is aware of employees' risk behaviour, and encourages employees to identify and report errors and near-misses (Dekker, 2007).

Just culture is defined as a culture of trust, in which what is allowed and not allowed is defined, for which fairness and responsibility are critical. A reporting culture promotes, and makes the identification process of, risk behaviour easier and supports the fixing of what is broken. A learning culture focuses on opportunities to learn from mistakes, errors, near-misses, and other safety-related problems. All these cultures are intertwined; for example, without a just culture, open reporting and improvement based on learning from mistakes are impossible (Reason & Hobbs, 2003). Learning from mistakes is possible only in a non-punitive environment where a proactive approach supports workers' perception that they are safe and that error reporting is aimed at protecting the patient (Battard, 2017). A proactive approach has been defined by healthcare directional organisations, such as the IOM (the US Institute of Medicine, now known as the National Academy of Medicine), the NHS (the UK National Health Service) and the World Health Organization (WHO), as a way to identify and register adverse events in healthcare institutions. This approach considers that errors are mostly system-based, that complete elimination is impossible, and that they are caused by careless actions (Dickey, Damiano, & Ungerleid, 2003; Runciman et al., 2003; Kohn et al., 2000). Such work errors are a precursor to accidents.

According to Reason (1998), accidents can be seen as individual or organisational, proposing that organisational accidents can be related to "local traps", which are characterised by the tendency to lead employees into danger. Following Reason (1998), I conclude that, in healthcare, high work demands and low professional competences can be seen as such traps. At the individual level, this means that employees aim to "*get the job done no matter how*" (Reason, 1998, p. 301) and that accidents are a part of the job, mistakes are hidden, and underreporting is common.

Previous studies have found that patient safety culture requires fundamental changes in management, moving from punishment to reward, creativity, and innovative understanding (Hess, 2017). Teamwork, open communication, less subordination, and involvement in the decision-making process are needed to develop just culture and a non-punitive environment. Supervisors who assess workers' performance according to non-punitive and impartial standards have found that transparency in relation to errors improves competences and perceptions of safety culture (National Association for Healthcare Quality, 2020). Creating a non-punitive environment helps to create a proactive approach whereby employees feel safe, report errors, and learn from them, as well as improving patients' safety (Frank-Cooper, 2014; Harrington & Smith, 2015).

Communication and mutual trust, seen as shared values and the efficacy of preventive measures, are all essential parts of a positive safety culture (Hinde, Gale, Anderson, Roberts, & Sice, 2016). Training is a key component of successful systems improvement and is based on fear elimination and continuous improvement in relation to near-miss reporting systems (Frank-Cooper, 2014; Harrington & Smith, 2015).

In conclusion, just, reporting, and learning subcultures are necessary components of safety culture. They are also a part of proactive SMSs that enable continuous improvement and help employees to avoid mistakes and increase their professional competences (Boysen, 2013; Wachter, 2013), which will be discussed in the following subsection.

1.3.2 Employees' professional competence

According to the IOM, healthcare organisations should provide quality, safe, patient-centred, timely, efficient, effective, and fair services; to achieve this, competent and educated specialists are needed (Batalden & Davidoff, 2007; Chang, Chen, & Wu, 2012; Nilsson et al., 2014). In healthcare, professionalism and adequate education are crucial in risk prevention in the context of employees' responsibility and clear understanding of safety (Grau, Martínez, Agut, & Salanova, 2002; Neuberg, Železnik, Meštrović, Ribić, & Kozina, 2017; Ratnapalan & Uleryk, 2014). Employees' incompetence is related to low job attitudes, causes frustration and job dissatisfaction, and also negatively affects job performance, as well as leading to occupational injuries (Dul et al., 2012; Hignett, Carayon, Buckle, & Catchpole, 2013). Inexperienced and incompetent employees are often unprepared to provide professional care for patients who need palliative and special care. Additionally, unprepared care workers do not meet the expectations of managers, patients' relatives, and their colleagues (Neuberg et al., 2017), while competent employees are able to deal with unsafe situations effectively and are more skilled in communication and conflict-management issues (Ahanchian, Emami Zeydi, & Armat, 2015; Chang et al., 2012; Heydari, Kareshki, & Armat, 2016).

Studies have shown that professional competences based on skills, knowledge, attitudes, values, and self-efficacy (Epstein & Hundert, 2002; Levett-Jones, Gersbach, Arthur, & Roche, 2011) influence employees' commitment (Karami et al., 2017), performance and patient outcomes (Batalden & Davidoff, 2007; Carayon, 2010), and occupational safety (Hignett et al., 2013). For example, in long-term care, employees should support people in ADL, e.g. tasks related to patient transfer or lifting. Professional competence consists of theoretical knowledge (how to transfer and lift), practical ergonomic skills for safe patient lifting, and attitudes (e.g. empathy). Mulder (2013, p. 98) defined professional competences as "*the capability to deliver sustainable effective performance (including problem solving and realising innovation) in a certain professional domain, job, role, organisational context, and task situation*". Further, according to Epstein and Hundert (2002), professional competences can be developed, are not permanent, and are influenced by the context. Following this reasoning, I came to the understanding that, in care institutions, training regarding professional competences should be addressed in the context of the organisational culture. Rothwell and Lindholm (1999) revealed that professional competences should be identified, modelled, and assessed at the work level. Mulder (2016) proposed that professional competences in healthcare should be expanded through corporate strategy and human resource management. The same author proposed that, to provide continuing professional development, transforming the workplace into a collaborative learning environment is necessary. Reason and Hobbs (2003) defined learning culture in terms of the opportunities to learn from mistakes, errors, near-misses, and other safety-related problems. This alone, however, is not enough; the work environment and professional competence culture should support each other. In my opinion, professional competence culture relates to the development of employees' professionalism as a result of the development of PI as well as the identification and assessment of professional competences (including the assessment of employees' perceptions of their professional competences). Mulder (2016) revealed that PI related to positive self-image develops through the employee's experiences, where work context develops based on the community, which is related to the theory of situated cognition. Expanding the roles of new employees depends on positive work experiences, positive feedback regarding

performance, and supportive relationships both with colleagues and supervisors (Mulder, 2016; Wald, 2015). Organisations should transform workplaces as well as culture to create an effective knowledge-sharing network in which social interaction supports PI and is in line with organisational objectives to improve the quality of working processes (Wong & Trollope-Kumar, 2014).

In conclusion, previous findings reveal that, to provide quality care, employees with professional competence and commitment are needed (Chang et al., 2012; Nilsson et al., 2014). Additionally, performance motivation has been seen as an essential predictor of the development of professional competence (Flin, 2007; Mulder, 2016). Competence related to confidence and job satisfaction influences employees' motivation to deal with complex situations and to fix communication problems with complicated patients. To ensure patient safety, good communication skills are needed (Batalden & Davidoff, 2007). This helps in dealing with conflict situations effectively, improving safety-related communication, and providing adequate information to colleagues, supervisors, patients, and their relatives (Hall, Moore, & Barnsteiner, 2008). Based on previous findings, I conclude that employees' professional competences and PI are closely related to employees' performance and organisational outcomes, which depend on the managerial and organisational setting (Jennings, 2009). Following Mulder (2016), I note that, in the context of OHS management, professional competences and PI should be seen as a predictor of safety behaviour in the context of positive safety culture. Additionally, other authors have revealed that it is not only employees' competences that influence work performance. Working experiences, individual attitudes (Axley, 2008; Chang et al., 2012) and employees' mental health (Eatough, Way, & Chang, 2012) should also be mentioned. According to previous findings, the development of PI relates to employees' well-being (Mavor et al., 2014). It has also been found that employees who perceive higher PI deal positively with stress (Jennings, 2009) and burnout (Wald, 2015). Psychosocial well-being will be discussed in the following subsection.

1.3.3 Employees' psychosocial well-being and mental health

In recent years, the changing nature of work has resulted in emerging risks and new challenges for workers' health and safety. Psychosocial risks, which arise from the interaction between job content, work organisation and management, organisational conditions, and employees' competences and needs, have been identified as significant emerging risks (National Institute for Occupational Safety and Health, 2002). Throughout Europe, researchers, practitioners, government bodies, social partners, and organisations differ in terms of the level of awareness and understanding of these new types of challenges in working life (Leka, Cox, & Zwetsloot, 2008; Leka & Jain, 2010).

The WHO Healthy Workplace Model (Burton, 2010; Neira, 2010) indicates the four components of a healthy work environment: the physical work environment; the psychosocial work environment; individual health; and organisational community involvement. Organisations' attention should be oriented toward the prevention of MHPs by assessing the hazards at source, and not concentrating only on stress management, pressure management training, or employee stress counselling (Health and Safety Executive, 2005). I agree that a purely reactive approach indicates that organisations accept hazards and their negative influences at the individual and organisational levels.

From the proactive perspective, it is important to mention that employees' psychosocial well-being and mental health are closely related to work performance and organisational

outcomes. Palmer, Cooper, and Thomas (2001) developed a model of work-related stress, which revealed potential hazards such as poor culture, high demands, low control, role conflicts, poor relationships, and a lack of support. Several authors have seen potential influences through individual and organisational outcomes. Individual symptoms relate to physical, behavioural, and cognitive symptoms, as well as psychological/emotional effects (Dyrbye et al., 2014; Ray-Sanneraud, Leyshon, & Vallevik, 2015). Organisational symptoms result in increased overheads (e.g. recruiting, training), reduced profits, increased accident rates and litigation, higher sickness absence, long working hours, increased staff turnover, reduced staff performance and morale, as well as increased hostility. Both individual and organisational outputs are related to high financial costs (Palmer et al., 2001). Psychosocial well-being can be divided into three dimensions related to employees' performance and healthcare system outcomes (Ray-Sanneraud et al., 2015). The first dimension is psychological and it relates to determinants such as burnout, psychological distress, low job satisfaction (Ray-Sanneraud et al., 2015), emotional exhaustion, tiredness, and sleep problems (Dhaini et al., 2016; Khamisa, Oldenburg, Peltzer, & Ilic, 2015; McCaughey, McGhan, Walsh, Rathert, & Belue, 2014; Peters, de Rijk, & Boumans, 2009). The second dimension is physical, which causes fatigue and poor physical health. The third dimension is social, which relates to determinants such poor social capital, poor workplace relationships, work–home interference (Ray-Sanneraud et al., 2015), incompatible role expectations from supervisors, poor leadership style, and abusive supervision (Eatough et al., 2012; Lazarus, 1991).

At the same time, several studies have found that a good and safe work environment, positive social support (Qin, Kurowski, Gore, & Punnett, 2014; Wagner et al., 2019), good relationships between colleagues (Heerkens, de Brouwer, Engels, van der Gulden, & Kant, 2017), and the availability of adequate training programmes and ergonomic equipment are associated with high motivation among care workers and a decrease in the rate of compensation claims for occupational injuries (Kamioka & Honda, 2012; Park, Bushnell, Bailer, Collins, & Stayner 2009; Ribiero, Cardia, & Almeida, 2012).

I conclude that, based on Brown et al. (2016) and Ray-Sanneraud et al. (2015), that organisations should prioritise the psychosocial well-being of employees. Preventive strategies should be implemented and continually improved. Regular assessment of psychosocial risks should be integrated at the organisational level (Ray-Sanneraud et al., 2015) and provide input to create a positive work environment (Brown et al., 2016; Westerberg & Tahvelin, 2014). Employees' psychosocial well-being should be supported by organisational culture and strategies. The conceptual framework of the main critical subcultures within healthcare institutions will be discussed and presented in the following subsection.

1.4 Conceptual framework of the research in the context of business administration

In this subsection, I present a conceptual framework developed based on the influencing factors of safety culture, which have been previously described. I also explain how the developed framework could be positioned within the business administration discipline.

Healthcare and care institutions are businesses that specialise in intangible products, such as treatment, nursing, and wellness. In order to design these products and offer services with high quality, several managerial inputs are necessary: adequate leadership;

effective human resource management; open communication; the adoption of quality standards; etc. (Collins, 2018). One of the core aspects of providing high-quality services in healthcare is having competent and skilled personnel who are able to perform daily routines accurately, effectively, in a timely manner, as well as safely (both for the patient and themselves). The current research focuses on those safety issues that address employees' safety where a proactive approach is necessary in order to maintain workforce sustainability, thus ensuring high-quality service and achieving predetermined organisational goals. A proactive approach requires a positive safety culture, strong occupational SMSs, continuous improvement, and appropriate preventive measures for minimising work-related accidents. This thesis focuses on different safety culture aspects that ensure employees' safety behaviour, thus acknowledging the importance of human interactions with equipment and environments. The importance of safety culture is clear in supporting and enabling the transfer of personal knowledge to institutional knowledge, with a particular focus on improving work and safety performance (Antonsen, 2009).

Additionally, the proposed framework represents a possible instrument for planning, staffing, directing, controlling, and work organisation for operations managers. For example, managers can use the results of the safety culture subculture assessments to identify weaknesses associated with psychosocial issues (e.g. staffing and work organisation), employees' competences and skills (e.g. directing), or the appropriate reporting of incidents (e.g. controlling). Operations managers should aim for continuous improvements, for which the framework is especially useful as it enables them to identify the current situation and make comparisons with earlier periods to decide whether on-going changes are effective. Moreover, operations managers should maximise the development of safety culture to ensure quality services and organisational outcomes (Sirriyeh, Lawton, Armitage, Gardner, & Ferguson, 2012). However, in healthcare management research, this approach is little used. For example, Manser et al. (2016) revealed evidence that the assessments of quality and patient safety and their relationship with safety climate measurement have been rather limited. Based on a multidisciplinary approach, I propose that, in order to create a positive safety culture in healthcare, especially in care institutions, as well as just, learning, and reporting cultures (Reason & Hobbs, 2003), *professional competence* and *psychosocial well-being* subcultures should also be developed (Figure 2).

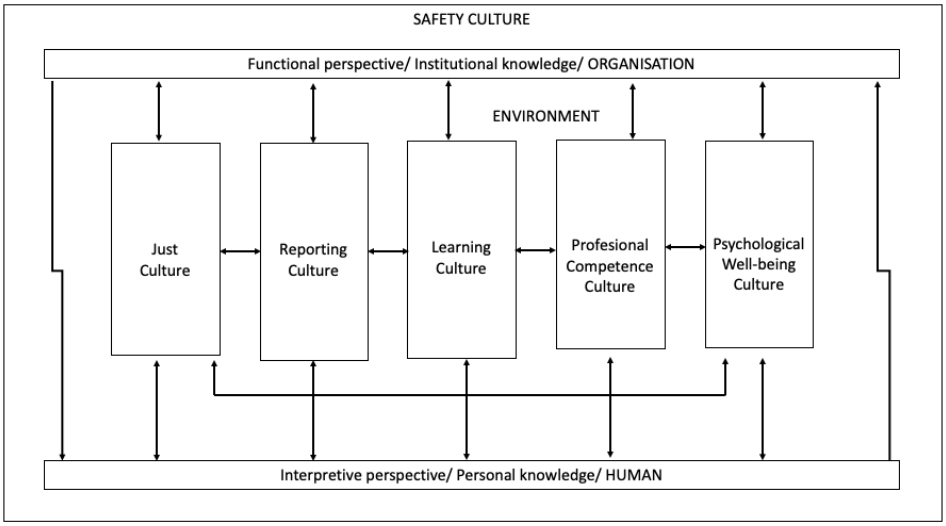

Figure 2. *The process of safety culture and knowledge transfer from the personal knowledge/interpretive perspective to* the *functional perspective.*

Source: Compiled by the author based on: a) subcultures (Reason, 1997, 2015; Reason & Hobbs, 2003); and b) safety culture components (Cooper, 2000; Geller, 1994; Reniers et al., 2011; Vierendeels et al., 2018).

Professional competence culture is important because it focuses on providing multifaceted support for employees in developing their PI and professional competence, which should increase their self-confidence as well as their motivation and commitment. Additionally, I propose that professional competences should be developed not only in educational institutions according to formal programmes, but also continuously in the workplace. I propose an explanation regarding competence culture as a culture whereby the development of employees' PI and professional competences are seen as a set of values, attitudes, perceptions, and opportunities to increase employees' commitment to safety and to improve safety behaviour and safety performance. Organisations should also use all opportunities from formal education and work-based training programmes to provide a life-long learning process within and outside of the organisation. In my approach, I rely on understanding that professional competences are based on values, skills, knowledge, and attitudes (Epstein & Hundert, 2002; Levett-Jones et al., 2011), and that they increase employees' motivation and commitment (Karami et al., 2017) as well as their safety performance (Batalden & Davidoff, 2007; Carayon, 2010).

The other proposed subculture, psychosocial well-being culture, is important because organisations with a high psychosocial climate, where managers are concerned about workers' well-being, ensure that employees will find enough resources to cope with demands (Dollard & McTernan, 2011; Wagner et al., 2019). According to my framework, patient safety is considered as important as the psychological health and safety of employees. If management is concerned about the balance between adequate job demands and employees' resources, then we can expect that employees' psychosocial well-being will be ensured. The management of psychosocial risks as a part of proactive safety management needs to be supported by a psychosocial well-being culture. Based on my findings, I define psychosocial well-being culture as the values and preventive

strategies that supports employees' mental health through shared work values, adequate work demands, appropriate work organisation, supportive interpersonal relationships, and good leadership.

The differential perspective enables a focus on subcultures and an understanding of how culture is constructed through complex social processes (Antonsen, 2009). In line with Antonsen (2009), I believe that the question of how cultures are created and recreated through the differential aspect has been ignored in previous research. In order to fill this gap, I propose and develop the presented framework. In this framework, three important components (human, environment, and organisation) constitute a holistic approach to safety culture as a basis for the proactive management of OHS in healthcare, in which safety culture is differentiated into five subcultures with omnidirectional knowledge exchange (Kalteh et al., 2021). In the context of business administration, it is essential to develop organisational activities to a level at which control is not continuously needed, and employees are motivated and committed to act safely and be ready to deliver high-quality services. This is the key aspect in the context of the intangible products of healthcare (treatment, nursing, and wellness).

The scientific literature reveals that the development of a conceptual framework is needed, because the existing theories are not sufficient to create a business structure for the healthcare sector (Adom, Hussein, & Agyem, 2018). The development of the conceptual framework allowed me to identify and construct my worldview for the investigated phenomenon (Grant & Osanloo, 2014) as well as present my proposed remedies to the problem and address the research gap (Adom et al., 2018; Liehr & Smith, 1999). Additionally, the conceptual framework allowed me to present the reasons why the topic of safety culture requires further study, which theories and positions I agree or disagree with, and how I conceptually ground my approach (Evans, 2007). Through the proposed conceptual framework, I explain the nature of the phenomenon and how the research problem can be explored (Liehr & Smith, 1999). The philosophical framework, logical structure, and methodology will be presented in the next chapter (Grant & Osanloo, 2014).

2 Methodology

2.1 Research design and philosophical foundations

Based on the scientific literature, the methodological choice adopted was pragmatism. Pragmatism is a conceptual and practical approach that is used to define problems and has a heuristic function in social research. Pragmatism provides instructions regarding how to reveal the problems and the methods required to solve them (Abbott, 2004; Antonenko, 2015). The strength of pragmatism lies in its philosophical framework, which enables the investigation of complex phenomena (Pappas, 2017) and the use of a mixed methods approach (Creswell, 2009). Epistemologically, safety culture has been defined as a paradigm of knowledge characterised by complexity and intractability with a special focus on comprehensive approaches (Haukelid, 2008). Pragmatism helps to create practical knowledge that could be useful for making purposeful differences in practice (Goldkuhl, 2012). Therefore, I decided to adopt the sequential explanatory mixed methods study design (Fetter et al., 2013; Othman et al., 2021) for this study. In stage one, I began with quantitative data collection and data analysis, which provided the input for the qualitative stage two (focus-group interviews). Subsequently, I integrated an advanced design with a multistage evaluations approach to investigate the other crucial aspects of safety culture (Guetterman, Fetter, & Creswell, 2015). The strengths of quantitative results and qualitative findings are combined into one mixed methods research in this study to generate useful outcomes and a holistic understanding of the research questions and the phenomenon under study (Timans, Wouters, & Heilbron, 2019). Additionally, the mixed methods approach enables the measurement of the safety culture phenomenon through a multidisciplinary approach using sociological, psychological, and educational instruments. The conceptual framework of the study is presented in Figure 3.

The design ensured that the conclusions of each subsequent stage were built on the results of the previous stage(s), which provides more details in relation to filling the research gap (Fetter et al., 2013). The integration of the main findings, based on quantitative and qualitative data, were analysed according to the staged approach and the results of each stage were reported step by step and published separately (Fetter et al., 2013; Guetterman et al., 2015).

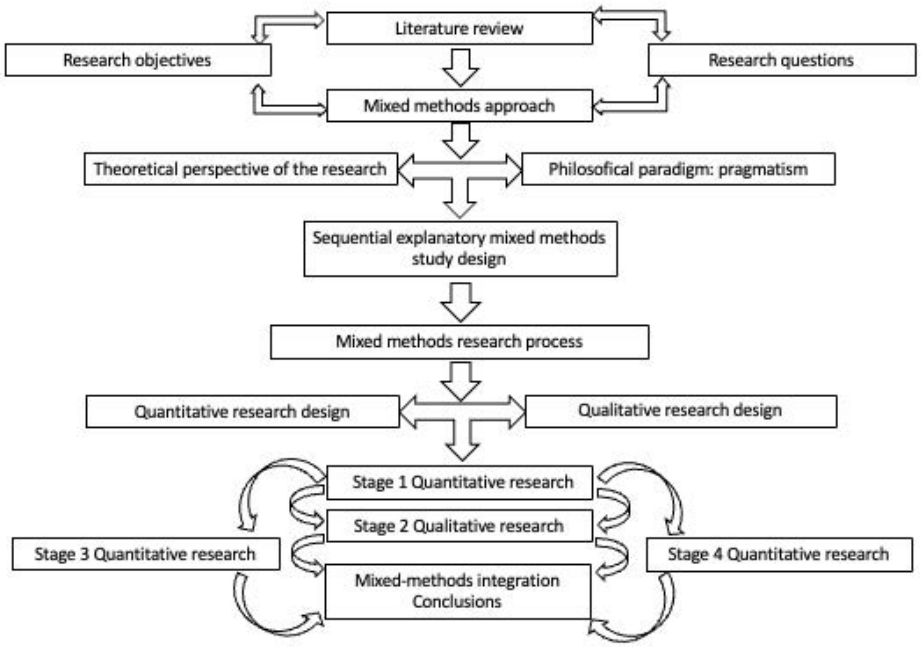

Figure 3. *Conceptual framework for sequential explanatory mixed methods study design, integrating* an *advanced design with* a *multistage evaluations approach.*

Source: Compiled by the author based on Othman et al. (2021) and Guetterman et al. (2015).

To reduce the risk of research bias, rigorous measures during the design, methodology, and interpretation stages were implemented. The research process addressed inclusion strategies, type of data collected, appropriate sample size, settings, data collection, and analysis procedures (Creswell, 2003) (Table 3). Separate procedures were used to assess the reliability and validity of quantitative data and to enhance the credibility and trustworthiness of the data and findings (see Section 2.4). For interpretation of the combined data, sequential quantitative and qualitative methods were used; conclusions were drawn based on the combine methods and data (Othman et al., 2021). All stages are based on ethical considerations, which will be detailed in Subsection 2.4.1.

Table 3. *Study design*: *mixed methods research process*.

Stage	Aim	Research question	Study design	Sample institution/ participants	Settings	Data collection methods	Data analysis methods	Ethics/Rigour
1 Quantitative	To explore care workers' perceptions regarding safety.	How do employees perceive safety culture?	Descriptive, correlational, quantitative	15/233	Institutions who offer: •follow-up nursing; •long-term care; •rehabilitation; •palliative care; •departments for people with cognitive impairment	Questionnaire NOSACQ-50	SPSS Pearson correlation, explanatory factor analysis, Cronbach's coefficient alpha, confirmatory factor analysis, Friedman test	•Validity •Reliability
2 Qualitative	To investigate the influence of the working environment on safety behaviour.	Which aspects of the working environment influence employees' safety behaviour?	Descriptive, qualitative	6/73		Focus-group interviews Questionnaire KIVAQ	Averages, qualitative content analysis, two-step coding, thematic categorisation	•Informed consent •Anonymity •Creditability •Dependability •Reflexivity
3 Quantitative	To analyse factors related to professional competence and safety behaviour.	How do care workers' professional competences influence their commitment to safety?	Descriptive, correlational, quantitative	7/241		Questionnaire	SPSS Pearson correlation test, Cronbach's alpha, *t*-test, Friedman test	•Validity •Reliability
4 Quantitative	To explore the relationships between psychosocial well-being and employees' MHPs.	How does psychosocial risk management influence employees' well-being and safety behaviour?		9/340		Questionnaire	SPSS Pearson correlation test, Cronbach's alpha, *t*-test	•Validity •Reliability

Source: Compiled by the author.

The types of quantitative research design (descriptive and correlational) enabled obtaining a clear picture of characteristics, trends, and relationships among the investigated variables. The qualitative approach enabled investigation of a specific context and consideration of the holistic understanding of the phenomenon. In Article II, using focus-group interviews and an interpretative or anthropological approach, I investigated meanings and symbols among persons involved in social processes in the studied groups. The possible problem with reliability was solved by testing the interview schedule prior to the interviews. The potential issue with the study's validity was solved by increasing the sample size, for which various data sources were used. This approach allowed me to specify evidence for underlying cultural assumptions and included complicated scientific measurement aspects (Scott et al., 2003a).

The generalisability of the study results was limited due to different sizes of groups participating in the studies. Another limitation was that we did not analyse the physical risks in a specific working environment. Further, occupational- and patient-safety-related case studies would have enriched our results. The research methods will be presented in the following subsection.

2.2 Research methods

The Nordic Safety Climate Questionnaire (NOSACQ-50) (Kines et al., 2011; Lipscomb, Schoenfisch, & Cameron, 2015) was used to assess care workers' perceptions regarding the safety climate of their workplaces based on seven safety-management dimensions. In addition, data regarding workers' occupational accidents, diagnosed occupational diseases, and psychological and physical conditions were collected. The questionnaire included seven dimensions: dimension 1 (management safety priority, commitment, and competence); dimension 2 (management safety empowerment); dimension 3 (management safety justice); dimension 4 (workers' safety commitment); dimension 5 (workers' safety priority and risk non-acceptance); dimension 6 (peer safety communication, learning, and trust in safety ability); and dimension 7 (workers' trust in the efficacy of safety systems). The tool contained 50 positively and negatively formulated items using a four-point Likert scale: strongly disagree (1); disagree (2); agree (3); strongly agree (4). The mean score was calculated for each dimension and respondent, as well as for the groups. A mean score of over 2.5 was considered a positive result, as this is the mathematical mean value of the highest and lowest score. In addition, respondents were asked to provide data concerning experienced occupational accidents and diagnosed occupational diseases, as well as to report possible health complaints (for example, pain in the neck, back, arms, or knees). Respondents' opinions and perceptions regarding patients' safety was assessed using a five-point Likert scale. The results of the first stage of the research are presented in Article I.

To deeply investigate the level of safety culture, with a particular focus on safety management justice, focus-group interviews were conducted. The study also included the KIVAQ questionnaire, which characterises worker well-being (Näsman, 2011) and stress (Saarnio, Sarvimäki, Laukkala, & Isola, 2012). Semi-structured focus-group interviews are considered the best method to describe the phenomenon of safety culture (Berry & Kincheloe, 2004) and to complement data received from the first stage of the study. The aim of the focus-group interview was to collect high-quality data in a social context. This helps to understand the investigated phenomenon from the viewpoint of the participants. Focus-group interviews revealed participants' understanding and also enabled the discussion of sensitive topics related to participants' needs or problems

(Dilshad & Latif, 2013). Safety management justice was defined as a factor that influences employees' safety responsibility and safety behaviour. This factor is positively influenced by managerial components, e.g. fair treatment and procedures, and handling accidents and near-misses. Through the focus-group interviews, I was able to collect evidence as well as positive and negative examples of safety management justice and its aspects, which support the continuous improvement process in care institutions. The role of the researcher was to moderate the discussions within the groups (Nyumba, Kerrie, Derrick, & Mukherjee, 2018). The topics discussed during the interviews were grouped into six themes: commitment; communication (including topics concerning reporting); management; collaboration; teamwork; and learning. All interviews were conducted in care institutions (in the workplace) with small groups of people. The maximum number of participants was 10 because a group of 10 people is large enough to collect a variety of perspectives and small enough not to become fragmented or disordered (Krueger, 1994). Focus-group interviews enabled interviewing a relatively homogeneous group and made the group think about a common topic (Dilshad & Latif, 2013). Each focus-group interview was based on the following steps: research design; data collection; analysis; and the reporting of the results (Morgan, Krueger, & King, 1998). Each discussion included two parts, which altogether lasted about four hours (with a small break). All interviews were recorded, transcribed, and analysed. The results of the second stage of the research are presented in Article II.

The relationship between employees' professional competences and their commitment to safety was explored in the third stage of the study (Article III). The CCQ was compiled by the author according to the Estonian National Occupational Standard for Care Workers (Level IV, the highest level for the professional competence of care workers in Estonia) in order to explore care workers' perceptions of their professional competences that are required for working in care institutions. Five sub-competences were defined and included into the developed CCQ based on this standard, and the topic "Commitment to safety" was added. The questionnaire thus included six topics: (1) necessary skills (knowledge of ADL, patient care); (2) necessary skills (knowledge for coping with the elderly and people with special needs); (3) communication skills; (4) first aid; (5) professionalism (awareness of speciality); and (6) commitment to safety. The tool included 31 items using a five-point Likert scale. Additionally, the tool included questions related to organisation of the in-service training, gender, age, demographic data, information about occupational accidents, diagnosed occupational diseases, and workers' psychological and physical conditions, as well as patient safety. The questionnaires in both languages (Estonian and Russian) were tested and validated.

To assess the psychosocial factors and their relationship with employees' MHPs, the Copenhagen Psychosocial Questionnaire version II (COPSOQ-II) was used (Kristensen et al., 2005) (see Article IV). Psychosocial factors were assessed using 115 items that covered the following four psychosocial domains: a) demands at work; b) work organisation and job content; c) interpersonal relationships and leadership; and d) values in the workplace. To assess the MHPs, 16 items, grouped into the following four scales, were used: burnout; stress; somatic stress symptoms; and symptoms of depression. Most of the scales for psychosocial factors and MHPs included three or four items, but two scales (predictability and work versatility) included only two items. The items were rated using six-, five-, or four-point Likert scales, based on validated methodology (Kristensen et al., 2005; Pejtersen, Kristensen, Borg, & Bjorner, 2010).

The questionnaires used (NOSACQ-50, COPSOQ-II) have been previously used in the scientific literature and are considered a reliable tool for cross-sectional surveys and suitable for assessing variables of safety culture (Kines et al., 2011; Lipscomb et al., 2015) and for the novel subculture "psychosocial well-being" (Kristensen et al., 2005).

2.3 Data collection

Primary data collection included quantitative surveys and focus-group interviews, which provided the raw data regarding the safety culture phenomenon. Interview transcriptions are a possible way to analyse the main objects in social interaction, communication, learning, and behaviour aspects (RQ2); analysing the empirical studies and statistical data (RQs 1, 3, 4) provided authoritative information and credible evidence for considering the results reliable. To answer the research questions presented in the current thesis, empirical studies were carried out between September 2014 and November 2017. The empirical part of the thesis was designed as a primary data-collection method based on four stages.

During the first stage of the study, a simple random sample was selected from 65 Estonian nursing homes in 2014, which at that time were registered with the Health Insurance Fund. These institutions were entitled to provide nursing services in nursing homes (31) or inpatient care in hospitals (34). The inclusion criteria for the study (offering follow-up nursing, long-term care, rehabilitation, palliative care, and care for people with cognitive impairment) revealed 19 institutions (33% of the population) covering all four regions of Estonia. Four of institutions declined to participate. Thus, 15 organisations (11 nursing homes and four inpatient care hospitals) were included in the final sample (five institutions from Northern, three from Western, three from Southern, and four from Eastern regions of Estonia); seven were located in rural areas and eight in cities. More than half (53.3%) of the selected institutions were private and 46.7% were from the public care system.

The paper-based questionnaires (NOSACQ-50), in Estonian or Russian, were distributed, after the pilot-study, from September 2016 to December 2016. A simple random sample was selected from 371 full-time care workers who had worked in the institution more than one year. The criteria for employees' participation were the same as in Articles I, III, and IV. A total of 233 completed questionnaires were returned (62.8%); 215 respondents were care workers and 17 were administrative workers.

During the second stage of the study, after the assessment of the safety climate, a simple random sample was selected from long-term care institutions involved in the first stage of this research using the following criteria: organisational size; geographical location (different parts of Estonia); and offering follow-up nursing, long-term care, rehabilitation, palliative care, and care for people with cognitive impairment. Three of the selected institutions were nursing homes and three were hospitals in which inpatient care services were also provided. A total of 73 care workers were involved in the focus-group interviews, the majority of whom were women. Participation was voluntary, an invitation letter was sent to each institution, and the criteria for participation were as follows: full-time care workers who had worked in the institution more than one year and who had completed the care worker occupational curriculum. Every department within the institution should be presented. The interviews were designed to take place in groups around ten participants. Deviation in group size was due to supervisors' permission to conduct only a single focus-group interview per day and their desire to form larger groups.

The third stage (Article III) of the study included four institutions from the previous studies (two nursing homes and two inpatient care hospitals) and three new ones (one inpatient care hospital and two nursing homes), which were selected based on the initial criteria from the first and second studies. A paper-based questionnaire (CCQ) was sent to all 362 care workers. The response rate was 66.6% (241 completed questionnaires); 133 of the respondents were care workers and 108 were nurses. The data were collected between January and May 2017.

The fourth stage (Article IV) of the study included four institutions from the previous studies (two nursing homes and two inpatient care hospitals) and five new ones (two inpatient care hospitals and three nursing homes). A licensed translator performed the translation of the COPSOQ-II questionnaire into Estonian and Russian, and validation of the questionnaires was performed. A cross-sectional survey (Creswell & Clark, 2007; Pluye & Hong, 2014) was conducted in nine long-term institutions from October 2017 to December 2017. A cross-sectional design is appropriate for the study of acute situations; in particular, it is useful for investigating the prevalence of a particular phenomenon and for studying causal relationships, such as risk and its potential predictors, and consequences (outcomes) (Zangirolami-Raimundo, Echeimberg, & Leone, 2018). The criterion for participation was as follows: full-time care workers who had worked in the institution more than one year. The tool was first piloted and edited, following which it was sent to respondents. A paper-based questionnaire was sent to all 509 full-time care workers; the response rate was 66.8% (340 completed questionnaires).

2.4 Data analysis

After the questionnaires were returned (NOSACQ-50, CCQ, COPSOQ-II), Microsoft Excel was used to insert the data retrieved from each questionnaire. Subsequently, the existing data were imported into the Statistical Package for Social Sciences (SPSS) software package, and the statistical analyses were performed using the IBM SPSS program version 22.0 (Article I) and version 24 (Articles III and IV). Data were analysed using descriptive statistics, which consisted of standard deviation, means, frequency tables, minimum, and maximum, in addition to inferential statistics (*t*-test, Spearman's correlation, Pearson correlation, linear regression, and Cronbach's alpha). Cronbach's alpha values were calculated for pre-defined scales and variables to indicate a level of internal consistency for the scale (Articles III and IV) (Table 4); values range from 1 (high reliability) to 0 (no reliability).

Table 4. *The dimensions, scales, number of items, Cronbach's alpha values, and the instruments used for measuring the subculture variables.*

Variable	Item	Cronbach's alpha	Scale	Instrument
Professional competence culture			Five-point Likert scale: strongly dissatisfied (1); rather dissatisfied (2); can't evaluate (3); satisfied (4); strongly satisfied (5).	CCQ
Scale 1. Skills: knowledge in ADL and patient care	10	0.897		
Scale 2. Skills: knowledge for coping with the elderly and people with special needs	6	0.877		
Scale 3. Commitment to safety	6	0.845		
Psychosocial well-being culture			Items were rated using six-, five-, or four-point Likert scales.	COPSOQ-II
Quantitative demands	3	0.858		
Work pace	3	0.849		
Cognitive demands	4	0.676		
Emotional demands	4	0.712		
Demands for hiding emotions	3	0.739		
Influence	4	0.777		
Possibility for development	4	0.761		
Meaning of work	3	0.836		
Commitment to the workplace	3	0.575		
Predictability	2	0.725		
Rewards	5	0.853		
Role clarity	3	0.848		
Role conflicts	4	0.835		
Quality of leadership	4	0.848		
Social support from colleagues	3	0.763		
Social support from supervisor	3	0.827		
Social relationships at work	3	0.774		
Trust	7	0.622		
Justice and respect	4	0.853		
Social inclusiveness	3	0.670		
Insecurity	4	0.839		
Satisfaction with work	4	0.823		
Work–family balance	3	0.839		
Conflicts between family and work	2	0.828		
Stress	4	0.845		
Somatic symptoms	4	0.641		
Symptoms of depression	4	0.736		
Burnout	4	0.904		

Source: Compiled by the author.

Exploratory factor analysis was used to extract the factor structure of the questionnaire. The purpose of this analysis was to reduce the number of variables. Principal component analysis and the Varimax rotation method were used (Article I). The *t*-test was used to define the variance in the data to assess differences between the means of subsets of the data (Articles III and IV). Confirmatory factor analysis was performed to confirm the identified dimensional structure of the scale (Article I). The Friedman test was used to verify that there was no statistical difference between various dimensions of the safety (Article I) and competence (Article III) questionnaires.

The Pearson correlation test was used to measure the linear relationship between pre-defined safety-climate dimensions (Article I), professional competences (Article II),

and correlations between psychosocial factors and MHPs (Article IV). The essence of the variables led to the interpretation of the strength of relationships (Polit & Beck, 2006). Every correlation with a value above 0.85, at a significance level of 0.01, was considered a very strong correlation; a moderated positive correlation above 0.5, at a significance level of 0.05, was considered a positive correlation; and a value under 0.5 was considered as a weak or very weak correlation. The sign (+ or –) has no impact on strength of the correlation (Gerrish & Lacey, 2010).

Conventional content analysis was used for the data gathered from the focus-group interviews. Data analysis started with reading all the data repeatedly to obtain impressions and an overall sense. Subsequently, analyses of the responses word-by-word were used to derive codes by first highlighting the exact word from the text that appeared to capture key thoughts or concepts. These criteria were developed following the purpose of the study.

2.4.1 Ethical considerations

All stages incorporated ethical considerations. Ethical approval and permission for all studies was obtained from the management of each institution and the Research Committee of Tallinn Health Care College, Estonia. The research design addressed the main research question and the conclusions related to the study purpose and the set of sub-questions. The methods and instruments used also related to the research questions, and their validity and reliability was tested. Participation in all studies was voluntary, and the anonymity and confidentiality of participants and organisations were guaranteed. Each questionnaire had a cover letter explaining the purpose, objective, and procedure of the study, as well as an option to decline to participate. Participants in the focus-group interviews were informed that they were free to leave the study at any time, without having to provide a reason. Participants signed the consent form before the interviews.

The next chapter presents the key results obtained.

3 Results

In this chapter, I explore the interaction between the potential predictors of care workers' and patients' safety with the aim of determining a holistic framework for the safety culture concept from the perspective of care institutions. Below, I present an overview of the main empirical results from Articles I–IV.

3.1 Evaluation of safety climate

To characterise safety culture, the quantitative assessment of safety climate dimensions was completed (Article I), thereby contributing to addressing RQ1. The study results reveal that all ratings for the safety climate in Estonian care institutions are positive. Based on my results, however, I posit that the quantitative assessment of the safety climate does not provide enough evidence to conclude that the safety culture is positive, even though the scores are high, and accidents and incidents rates are low (see Chapter 4 for a detailed explanation). According to the study results, 5.6% of respondents have experienced occupational accidents and 4.3% of respondents have been diagnosed with occupational diseases (Article I). Two years later, the numbers were higher (10% and 14.6%, respectively) (Article III). My results indicate that there are several problems with psychological and physical health [76.4% of respondents complain about stress, 82.8% of respondents report physical pain, and 48.9% of respondents report low back pain (Article I)], which are the consequences of patient lifting and transfer as well as high physical demands (Article II). My results are in line with previous findings that musculoskeletal injuries are more common among workers in nursing homes than in other occupations (Trinkoff, Johantgen, Muntaner, & Le, 2005; Trossman, 2007) and can be related to the high level of workload pressure (Blanco-Denoso et al., 2021) and psychosocial risks (Bernal et al., 2015; Ribeiro et al., 2018).

My study supports previous results and suggests that solely quantitative measurements of the safety climate cannot provide complete results due to cultural and historical influences (Järvis, 2013). This paradox can be explained by the fact that care workers' safety perceptions are influenced by their previous experience and whether unsafe behaviour was accepted, which seems to be the norm. Combined methods including qualitative measurement can identify deviation in the norms and reveal the authentic aspects and reasons why accidents and incidents are underreported (Haas & Yorio, 2016). Based on theoretical knowledge, the low level of occupational accidents and incidents relates to positive safety culture (Vredenburgh, 2002), but my study demonstrates that it can also be related to the underreporting of accidents and incidents due to a variety of causes and an inadequate understanding of safety issues. For instance, the qualitative results of my study indicate that a low level of occupational accidents and incidents can be also caused by fear, stigmatisation, and inadequate understanding of employees' inappropriate behaviour (Article II). A positive safety culture leads employees to behave safely and prioritise patient safety. The importance of safety is based on employees' perceptions and includes elements such as feedback and non-punitive responses to errors, open communications, teamwork, and organisational learning (Khoshakhlagh, Khatooni, Akbarzadeh, Yazdanirad, & Sheidaei, 2019).

The correlation between the safety climate dimension "Management safety justice" and patient safety in the unit demonstrates that employees' safety behaviour is influenced by just management treatment. My study supports, as previously mentioned (Chen, Chang, Chang, & Lin, 2015), that management safety justice influences workers'

commitment to safety and safety behaviour. In addition, the results of the study reveal that dimension 7 (workers' trust in the efficacy of safety systems) has the highest score, but does not have any correlations with other dimensions (Article I). My results demonstrate that, even though employees perceive that the safety climate is positive and their trust in the efficacy of safety systems is high, this does not mean that they are involved in OHS management or trust the SMSs (Articles I and II). My results support previous findings that the assessment of safety climate is an effective tool in identifying the strengths and weaknesses of safety culture and comparing cultural scores with other indicators, such as accident reports and occupational and patient safety outcomes (Basson, Montoya, Neily, Harmon, & Watts, 2018).

3.2 Just, reporting, and learning subcultures

In Article II, I investigated deeper levels of safety culture in care institutions in the context of an interpretive perspective through personal and group knowledge, thereby contributing to answering RQ2. Safety culture has been seen as a leading indicator, in which proactive components, such as the reporting of near-misses, open communication, and continuous improvement, are necessary (Sinelnikov et al., 2015; Vieira Neto, Barroso, & Goncalves, 2009). Hinde et al. (2016) demonstrated that open communication increases mutual trust between colleagues, as well as collaboration, and provides opportunities to improve workers' competences and working performance. Just culture focuses on establishing the system for, and management of, organisational outcomes related to employees' behavioural focus on error prevention (Marx, 2001, 2008). Gorini, Miglioretti, and Pravettoni (2012) emphasised the importance of a blame-free culture, in which errors are not ascribed to individual responsibility and actions, but seen rather as ways in which to learn from mistakes and to make improvements, as well as organisation-based interventions. Sharing such attitudes and understandings towards health and safety (Khatri, Brown, & Hicks, 2009) should contribute to creating a safety culture that enables the reduction both of blame and punishment within the organisation (Helmreich & Merrit, 2001; Reason, 1997; Reason & Hobbs, 2003). My results from Article II, which are based on focus-group interviews, demonstrate that open communication, teamwork, mutual trust, and employees' involvement in OHS activities and decision-making process increase employees' motivation and collaboration between colleagues. According to my findings, the reporting practices and safety communication in Estonian care institutions are poor. This seems to be as a result of employees' fear of being stigmatised and punished. My results demonstrate that care workers are aware of the main occupational risks and the required safety measures; however, this cannot always be reflected in practice and their safety behaviour. The causes for this are as follows: a lack of resources (e.g. enough time to perform tasks and appropriate tools); poor professional and safety-related training (ergonomic and hygiene); and poor mechanisms for effective communication. Employees admitted that they do not have opportunities to discuss safety-related issues with each other because the investigated organisations do not support this and the management do not see it as important. Based on the qualitative results, care workers emphasised the need to share information, knowledge, and their experiences, as well as talking openly about mistakes among colleagues (in the words of respondents, "*it could be beneficial and would save time, ensure quality services as well as patient safety*"). Even though learning from mistakes is not a common practice in Estonian care institutions, the results from the current study demonstrate that care workers see it "*as an opportunity to analyse their own and others'*

mistakes as well as to learn from them and, thus, to avoid similar mistakes in the future". My results contribute to a new view of knowledge exchange by acknowledging the importance of properly managed and exchanged knowledge as a part of an SMS. Further, involvement in OHS activities and decision-making processes should be based on mutual trust and responsibility among employees and management.

Based on the results of Article II, I can conclude that care workers' safety behaviour depends on a non-punitive working environment, which is based on a blame-free approach, open communication, the reporting of near-misses, and opportunities to learn from mistakes. Just culture ensures mutual trust between management and employees and also increases employees' commitment to safety and safety behaviour (Articles I and II). My results shed a new light on just culture and portray this phenomenon as an organisational opportunity to create a proactive approach both for a safe working environment for care workers and a comfortable living environment for residents. These results are in line with previous findings that employees' health and safety are linked to patient outcomes and that both phenomena are influenced by the same managerial mechanisms (Cooper et al., 2017; Pousette et al., 2017) related to establishing a non-punitive working environment with a blame-free approach focusing on error prevention.

3.3 Professional competence culture

In Article III, I examined the relationship between care workers' commitment to safety and their perceptions of professional competences, thereby contributing to addressing RQ3. Professional competences based on skills, knowledge, attitudes, values, and self-efficacy play a critical role in healthcare services (Batalden & Davidoff, 2007; Levett-Jones et al., 2011) and are associated with employees' motivation, commitment (Karami et al., 2017; Dul et al., 2012), and safe performance (Hignett et al., 2013; Carayon, 2010; Batalden & Davidoff, 2007). The results of the third study (Article III) indicated that only 51.7% of care workers in the investigated institutions have an occupational certificate that corresponds to "Care Worker Level IV" (the highest level for the professional competence of care workers in Estonia). My results are in line with previous findings and confirm that, in care institutions, there is a lack of professionally educated staff (Bondevik et al., 2017; Hignett et al., 2013; Salonen, 2009). Many researchers have emphasised the need for changes and interventions in this field because care workers' poor competency is related to low levels of job attitude, commitment, and professional affiliation (Hignett et al., 2013; Dul et al., 2012).

These results are in line with those of previous studies (Chang et al., 2012; Nilsson et al., 2014) that employees' professional competences increase the ability to deal with complex tasks and people with special needs. My results reveal that care workers' professionalism depends on employees' perceptions of occupational and safety knowledge, communicational skills, and necessary skills and knowledge in providing first aid (see Figure 1 in Article III). This means that employees with higher professionalism have higher estimations regarding their PI and can solve patients' problems, support their independence, and counsel residents and their relatives. Care workers who have positive perceptions regarding their knowledge of ergonomics perceive their performance to be safe. Further, those who are confident in their knowledge and skills in relation to patients' hygiene perform these tasks safely and effectively, and believe that they are also able to provide patients with good instructions for their daily activities. My results show that care workers value the importance of having relevant skills and

knowledge for coping with the elderly and people with special needs. However, my results also indicate that although care workers estimate their knowledge and skills in patient hygiene and coping in daily life as high, they feel less confident in organising residents' healthcare and rehabilitation services (Article III).

Additionally, my results show a correlation between care workers' professional competences and commitment to safety, and vice versa, which means that employees who are more committed to safety also have a higher estimation of their knowledge and skills in ADL and patient care. The results of analyses of the "Commitment to safety" dimension show that involvement in OHS activities increases employees' motivation to discuss safety-related issues with management and inform managers about safety problems, as well as to propose adequate safety measures. Uphill linear relationships showed that care workers appreciate their participation and involvement in safety activities as well as the ability to discuss safety issues with management.

Based on my results, I conclude that professional competences and PI influence care workers' behaviour and willingness to offer quality and safe care service, to communicate with residents and their relatives, and to motivate residents to cope in daily life independently. I provide support for Epstein and Hundert's (2002) assertion that the development of employees' professional competences should be assessed and supported by formal education and in-service training programmes. I conclude that the continuous development of employees' professional competences and their participation in OHS activities enhance employees' commitment to safety, positively influencing employees' performance as well as the quality of care. Other researchers (Hall et al., 2008; Mann, Marcus, & Sachs, 2006) have revealed similar results. Managers should realise that the development of a positive safety culture includes the involvement of employees in the planning process and depends on management commitment to safety. The improvement of safety is possible in organisations with shared perceptions of safety, open communication, teamwork, and organisational learning (Khoshakhlagh et al., 2019).

Additionally, I suggest complementing the vocational national standard of "Care Worker Level IV" by including safety-related topics into the curriculum to improve care workers' safety knowledge. This is because safety performance depends on employees' safety competences, which enhance critical thinking and teamwork (Jin & Yi, 2019) as well as supporting the recognition of occupational risks and preventing and minimising adverse events, injuries, incidents, and accidents (Endacott, Kidd, Chaboyer, & Edington, 2007; Levett-Jones et al., 2017).

3.4 Psychosocial well-being culture

In Article IV, I investigated the characteristics of psychosocial risk management in care institutions and its potential impact on employees' well-being and performance, thereby contributing to answering RQ4. My study showed that self-reported psychosocial factors and health problems in Estonian care institutions are relatively high (stress, 69.1; burnout, 63.5; somatic symptoms, 79.4; and depression symptoms, 77.1) (Article IV). My results support previous findings that the healthcare sector, including nursing and care homes, are among the high-risk sectors with negative consequences related to employees' mental health and well-being (Flin, 2007; Garret, 2008; Li et al., 2010) as well as patients' injuries (Ray-Sanneraud et al., 2015). The statistical analysis showed that care workers' perceptions of emotional exhaustion are positively correlated with burnout, somatic symptoms, and symptoms of depression. According to these results, it can be

stated that emotional demands negatively influence employees' ability to concentrate, memory, clear thinking, and decision-making, as well as employees' performance. My results support previous findings that employees who feel emotional exhaustion are less satisfied with their job and question their professionalism; this is also closely related to professional satisfaction, performance, and organisational outcomes (Blanco-Donoso et al., 2021; Deusdad, 2020).

I relied on the notion that employees' mental health is influenced by psychosocial factors at work and the quality of leadership (Dehring, Treuer, & Redley, 2018; Eatough et al., 2012). Statistical analysis of the psychosocial factors of my study indicates that employees' recognition, predictability, social support from management, social inclusiveness, and quality of leadership have negative correlations with MHPs. My research also showed that employees in care institutions perceive that they do not have possibilities to develop and cannot influence their work, which is demotivating and evidently also affects their commitment to work and safety. To avoid these negative effects, the management should be proactive and committed to safety (Bosak et al., 2013), provide a safe and supportive working environment (Rahman, Naing, & Abdul-Mumin, 2017; Qin, Kurowski, Gore, & Punnett, 2014), and ensure appropriate work organisation and positive relationships (Eatough et al., 2012; Heerkens, de Brouwer, Engels, van der Gulden, & Kant, 2017). This is in line with previous findings that employees who perceive more social support from supervisors express a high level of professional satisfaction (Westerberg & Tahvelin, 2014; Zhang, Punnett, & Gore, 2014). Additionally, it was found that social support from colleagues and supervisors helps employees to achieve their work goals and protect them from negative aspects of work environment (e.g. stress) (Blanco-Donoso et al., 2021). I also find myself in agreement with Chen et al. (2016) that it is not enough for managers to recognise the importance of social support in work process; in order to reduce care workers' occupational stress, supervisors should maximise the quality of life for these health professionals.

In conclusion, regarding the results of Article IV, I note that employees' mental health and psychosocial well-being, as well as their safety performance, depend on psychosocial risk management. I concur McCarthy, Wills, and Crowley (2018) that, to improve the management of psychosocial factors supervisors, leaders and other management component, especially operations managers, need to collect feedback from employees about the work demands and involve employees in planning and redistributing workloads. This feedback and social support from supervisors enables greater predictability and minimises role conflicts (Chanchai et al., 2016). Additionally, managers should respect the limitations of each employee and utilise them in activities compatible with their work capacities. In this context, the role of the operations managers is related to the development of the capacity of human resources (McCarthy et al., 2018).

4 Discussion

In this thesis, I have identified potential predictors of care workers' and patients' safety and determined a holistic framework for the safety culture concept from the perspective of care institutions. I acknowledge that the safety culture is a complex phenomenon comprising multiple reciprocal components, including human (Edorisiagborn, 2015), environment (Cooper, 2000; Geller, 1994; Reniers et al., 2011; Vierendeels et al., 2018), and organisation (Bennett & Foster, 2005; Cappelen et al., 2016; Dollard & McTernan, 2011; Halligan & Zeveivic, 2011). In the context of safety culture, I propose that these components interact at the intersections of organisational fields through differentiated subcultures. Focusing on subcultures, I have presented the meanings of defined critical predictors, specifically safety culture subcultures (professional competences, psychosocial well-being, and learning, reporting, and just culture; see Figure 2). I have described safety culture from interpretive and functional perspectives (Vieira Neto et al., 2009) and explained how safety culture is influenced through social processes within the organisation (Antonsen, 2009) and how it is manifested through shared understandings of safety.

Based on the theoretical fundamentals, I have proposed a new framework for safety culture that focuses on four aspects: (1) assessment of the safety climate; (2) exploring how safety culture influences employees' safety behaviour; (3) assessment of the relationship between professional and safety competences and their connections with care workers' commitment to safety; and (4) assessment of psychosocial risk factors. This innovative approach enabled defining the subcultures of a positive safety culture and established the link between subcultures and safety culture components.

4.1 The role of safety culture based on the complexity of healthcare and long-term care phenomena

Scientific research has proved that a positive safety culture and proactive SMSs are needed to provide quality services in healthcare (Francis, 2013; Kirkup, 2015; Yorio, Willmer, & Moore, 2015). However, safety culture theory is still at a nascent stage and there is a need for innovative and holistic solutions (Haavik, 2014). Antonsen (2009) pointed out that the differential perspective has been previously ignored and, therefore, the interpretation of the meanings and understanding of safety culture may be insufficient. To date, studies have been oriented mainly toward analyses of safety-culture components or factors related solely to patients' or employees' safety (Bondevik et al., 2017; Flin, 2007; Puosette et al., 2017). In order to fill this research gap, I adopted a holistic approach, focusing on all the subcultures of safety culture and their reciprocal influences in order to obtain a clear understanding of safety culture.

In Article I, I complemented the existing knowledge of safety culture by demonstrating that high safety-climate ratings may not always reflect the real state of the art of safety. I showed that, even though safety climate scores were evaluated highly, and care workers trusted the efficacy of SMSs, there remain many contradictions (e.g. the rates of stress were reported as high, but the number of accidents and incidents was rated as low; the rates of physical complaints were reported as high, but the rates of registering occupational diseases were low). This paradox could be explained by the fact that underreporting, poor communication, risk acceptance, and incidents often are seen by care workers as a part of their job. Based in Articles I and II, I support previous findings that safety culture should be measured using a mixed methods approach (Denison, 1996; Flin, Mearns, O'Connor, & Bryden, 2000) because the results of the questionnaire do not

present the reciprocal dynamic between employees' perceptions and behaviour regarding safety. Many external influences must be considered, including relevant legislation, regulations, history, norms, and the social-economic situation, while interpreting the results of the safety-climate assessment. My results revealed that safety culture and its subcultures (i.e. just, reporting, learning, professional competences, and psychosocial well-being) are underdeveloped in the investigated institutions, which can be explained from an anthropological perspective due to the deep-rooted historical influence. This assertion is supported by the calculated correlations for dimension 7 (NOSACQ-50) (workers' trust in the efficacy of safety systems). Although the score was high, there were no correlations with other dimensions, thus not reflecting employees' safety behaviour, particularly in relation to safety compliance (Article II). This adds to our understanding as it demonstrates that employees can evaluate trust in the efficacy of SMSs highly, while not being involved in different health and safety activities or decision-making processes. My research has indicated that managers use safety empowerment to transfer and convey their beliefs and values among all members of an organisation.

Additionally, my results show that the transfer of beliefs and values is effective in environments with open communication, mutual trust, and the possibility of learning from mistakes. This facilitates safety culture and safety performance and can occur in an organisation with high just culture and reporting culture (subcultures of safety culture). Based on these results, I assert that, in the investigated care institutions, safety is not always an organisational value and unsafe behaviour is common. The perceptions of safety culture in the investigated institutions depends on SMSs, management commitment to safety, and social relationships among colleagues. My findings support previous results that different groups within institutions could have their own interpretation of safety, as well as their own subcultures, values, norms, etc. (Danielsson et al., 2014). From the functional perspective, this is a novel finding, as it illustrates the role of historical or collective memory and understanding in the safety phenomenon. It is important to acknowledge that signs of post-Soviet principles in the investigated institutions were observed; thus, the historical memory hinders adopting the beliefs and values related to high safety compliance. According to Antonsen (2009), safety culture competence is of great value. When employees are involved in safety decision-making and are responsible for safety, then safety is rather a shared value and a manifestation of justice. This should avoid safety culture transforming into an authoritarian safety doctrine. Previous studies have demonstrated that the role of managers is to develop safety measures, procedures, organisational structure, and a safe working environment, which encourages employees' safety behaviour (Wagner et al., 2019). It is important to note that a positive safety culture is a way to encourage employees´ safety behaviour. From a managerial point of view, the design of SMSs should be based on knowledge of how different groups in an organisation perceive safety (Sirriyeh et al., 2012). I add to the body of knowledge regarding cultural differentiation in that care workers see safety more as authoritarian; managers should thus use more innovative approaches regarding how to share and distribute safety values, knowledge, and skills. In my research, the differential perspective can be considered an innovative approach to management and cultural theory, and the proposed framework can be used as an explanatory tool for dealing with complex safety challenges. I further contribute to previous knowledge in that, within an organisation, the existence of more than one safety culture is apparent (Mannion & Davies, 2018) and care workers in post-Soviet regions perceive safety through the prism of history.

4.2 The role of just, reporting, and learning subcultures and their relationship with employees' safety behaviour

In Article II, I confirmed the results of previous studies (Reason, 1998; Sammer et al., 2010; Titlestad et al., 2018) that just culture influences care workers' safety behaviour and balances the need for an honest and open reporting environment. It is important to emphasise that just culture needs a change in focus from errors and outcomes to openness and trust in employees (Boysen, 2013; Gorini et al, 2012; Marx, 2001). From the organisational perspective, to develop a non-punitive working environment and blame-free culture, it is important to promote teamwork, commitment to safety, learning, collaboration, and open communication. My findings contribute to previous findings that not only do nurses and doctors value the possibility of learning from mistakes and openly talking about errors, nurse assistants and care workers also value open communication and discussing issues related to patient safety (Danielsson et al., 2014). A strong just culture should allow balance to be achieved between punishments and rewards (Hess, 2017), with open communication being a precondition for the reporting of near-misses and an input for learning from mistakes (Boysen, 2013; Reason, 1998). Reason (1997) proposed that, in just culture, responsibility for safety is taken, fair punishment is accepted, and reporting is seen as an opportunity to avoid the same mistakes happening in the future. My study confirmed Reason's theory and demonstrated that fear of being stigmatised and being punished minimised the willingness to discuss safety-related issues among colleagues and with management, and decreased opportunities to learn from mistakes and near-misses. I support previous studies (Dekker, 2007; Gorini et al., 2012; Khatri et al., 2009) that blaming and punishing employees decreases individual and collective improvement efforts.

The interviews (Article II) indicated that, in the investigated care institutions, care workers´ unsafe behaviour is a result of poor involvement in OHS management and decision-making processes. Employees also explained unsafe behaviour through poor work organisation, a lack of resources (such as time and necessary equipment), and the absence of appropriate ergonomic and psychosocial risk prevention. In addition, discussing safety-related issues with colleagues and managers seemed not to be a common practice, owing both to time pressures and the organisational culture, which hinder discussions regarding safety. This result is compatible with that of Aiken, Sloane, Bruyneel, van den Heede, and Sermeus (2013), who found that management do not listen to nurses' complaints concerning issues related to patient safety. As a result, nurses conclude that safety is not management priority. I corroborate the position of Wagner et al. (2019) that management should be more visible, not only to medical staff and nurses, but also to care workers, and communication between management and nursing and caring staff should be improved.

Healthcare systems are based on an approach aimed at avoiding errors in the future; therefore, hazards should be discovered and revealed. Mistakes are generally due to system-related factors and the fixing of the system enables a reduction in the number of errors and their associated negative effects, which influences patients' safety (Gorini et al, 2012) and prevents errors from happening in the future. My findings are in line with those in other research (Aven, 2014; Haukelid, 2008), which has asserted that, in order to create a proactive approach, a non-punitive working environment and a blame-free culture should be developed. A proactive approach is the precondition for the reporting of near-misses, near-accidents, and adverse events, as well as for continuous improvement

(Battard, 2017; Collins, Block, Arnold, & Christakis, 2009; Frank-Cooper, 2014), which should be supported by just, reporting, and learning subcultures (Frank-Cooper, 2014; Harrington & Smith, 2015; Vieira Neto et al., 2009).

In Article II, I added to previous research by demonstrating that just culture supports organisations in developing proactive SMSs and helping to ensure employees' safety behaviour. Organisations should create a safe working environment based on mutual trust; primarily, the management should be committed to safety and encourage employees to identify and analyse errors and near-misses, as well as consciously encouraging employees to behave safely (Dekker, 2007). My results support previous findings in the context of Swedish hospital care that employees value organisational-level factors, e.g. well-functioning routines, open communication about patients and errors, managers who adhere to rules, and an appropriate work environment (Danielsson et al., 2014). Based on my results, I contribute by suggesting that it is possible to fill the gap between human and organisational levels (interpretive and functional perspective) by improving social interaction and learning in the workplace through the subcultures of safety culture. Just culture and mutual trust have a crucial impact because dialog is impossible without trust.

4.3 The role of professional competence culture

In healthcare, employees' professional competences influence employees' motivation, self-efficacy (Batalden & Davidoff, 2007; Epstein & Hundert, 2002; Levett-Jones et al., 2011), commitment (Dul et al., 2012; Karami et al., 2017), and safety performance (Batalden & Davidoff, 2007; Carayon, 2010; Hignett et al., 2013; Jin & Yi, 2019). I have confirmed previous findings that professional competences increase the ability to deal with complex situations and positively influence employees' self-confidence, motivation, and job satisfaction (Ahanchian et al., 2015; Chang et al, 2012; Heydari et al., 2016). My results are in line with previous findings that employees' high levels of professionalism and professional satisfaction enable them to manage high job demands, pressure, exhaustion, and distress, while social support at work is a precondition for positive coping (Blanco-Donoso et al., 2021). My results showed that care workers who estimate their practical knowledge and skills highly feel more confident in providing nursing and caring services. However, those tasks that need more organisational skills are lacking among care workers. I also revealed that respondents who estimated their competences in problem solving and communication skills highly are better able to encourage and motivate elderly patients for independent coping in daily activities and are more confident in communicating with the residents' relatives. Based on my research, I was able to propose ways in which to ensure employees' continuous development of professional competences. I concur with the conclusions of Epstein and Hundert (2002) that professional competences should not be seen as a permanent capacity of employees and need to be continuously improved. The development of new technologies, as well as nursing and caring techniques, create requirements for employees' continuing development, which should be addressed not only during professional studies, but also in the workplace, e.g. in-service training (Buljac-Samardzic, Doekhie, & van Wijngaarden, 2020; Rothwell & Lindholm, 1999; Wong & Trollope-Kumar, 2014).

In my study, I adopted Mulder's (2016) and Jennings's (2009) notion that organisations should transform workplaces into learning and collaborative environments that support employees in the continuing development of their professionalism. This continuing development should be supported by organisational strategy and objectives as well as

human resource management (Mulder, 2016; Jennings, 2009). My empirical evidence is in line with previous findings that employees' professionalism positively affects employees' job attitudes (Dul et al., 2012; Hignett et al., 2013) and commitment to safety (Karami et al., 2017). Professional competences should be identified, assessed, and modelled in the workplace (Rothwell & Lindholm, 1999), because all knowledge cannot be addressed without a social, cultural, and physical context (theory of situated cognition) (Wald, 2015). Based on this, I contribute to safety culture theory in that professional competence culture, which values a life-long learning approach and promotes employees' continuing education, should be developed within organisations. I consider this to be an innovative aspect in safety culture theory, because the previously defined learning culture (Reason & Hobbs, 2003) limits understanding of the development of employees' professional competences through the concept of learning from mistakes in the working environment or other training programmes. My results support previous findings that learning from accidents and incidents is a key component of successful SMSs and that effectively organised improvement practices in practice enhance organisations' safety and productivity (Sujan, Huang, & Braithwaite, 2017).

In the context of the complexity of the safety culture phenomena (Aven, 2014; Filho & Waterson, 2018; Haavik, 2014; Schulman, 2020) and OHS management, professional competences and PI should be seen as predictors of safety behaviour, because my results also showed that employees who estimate their knowledge higher are more committed to safety (Dul et al., 2012; Karami et al., 2017). I specify employees' professional competence culture as a precondition for the systematic development of a positive safety culture. With this new knowledge, I contribute to the existing safety culture approach. I also contribute to safety culture theory by adding a description of professional competence culture, which should be seen as the organisational capacity to value and use all opportunities from formal education systems and in-service safety training programmes to provide a life-long learning process within and outside the organisation.

4.4 The role of psychosocial well-being culture

The management of employees' psychosocial well-being has been seen as a part of OHS management for the last decade (Iedema, 2009). Organisations should focus their attention on the development of a psychologically safe working environment, positive social support (Qin et al., 2014; Ribeiro et al., 2018), and promoting good relationships between colleagues (Chen et al., 2016; Wagner et al., 2019). In Article IV, I support previous research by demonstrating that appropriate work organisation, social inclusiveness, justice, respect in the workplace, the meaning of work, and development possibilities are all associated with employees' positive mental health. I confirmed the results of previous studies (Eatough et al., 2012; Ray-Sanneraud et al., 2015; Ribeiro et al., 2018) that healthcare employees' safety performance depends on psychosocial well-being through psychological (Dhaini et al., 2016; Khamisa et al., 2015; McCaughey et al., 2014; Peters et al., 2009; Ray-Sanneraud et al., 2015), physical (Ray-Sanneraud et al., 2015), and social dimensions (Eatough et al., 2012; Lazarus, 1991). My results also confirmed the conclusion of Dollard and McTernan (2011) that the psychosocial safety climate refers to a climate that ensures the psychosocial well-being of workers through the balance of resources and demands. It includes such aspects as organisational systems, policies, practices, and procedures, the level of senior management commitment, organisational communication, and employees' participation and involvement in health

and safety activities. This result is in line with that of Eklöf et al. (2014), who confirmed that appropriate safety management, as well as the evaluation of safety processes, facilitates improvement in OHS communication and promotes occupational and psychosocial well-being.

According to employees' perceptions, the allocation of resources is important because it shows employees' inclusion in OHS management. My findings prove that the availability of ergonomic equipment and training influence employees' motivation and safety performance. According to my findings, social support and the adequate allocation of resources can be considered the leading indicators for the prevention of occupational illnesses related to employees' mental health (Kamioka & Honda, 2012; Park et al., 2009; Ribiero et al., 2012), as well as safety performance (Dhaini et al., 2016; Ray-Sanneraud et al., 2015). Mentally healthy staff make fewer mistakes, they are more committed to safety, and demonstrate good behaviour and interaction with management, patients, and colleagues (Kuenzi & Schminke, 2009).

I agree with previous assertions (Brown et al., 2016; Ray-Sanneraud et al., 2015) that employees' psychosocial well-being should be prioritised, regularly assessed, and improved. In Article IV, I emphasised that a positive working environment should be supported by organisational culture, focusing on psychosocial well-being where employees' mental health is considered valuable and shared by all organisational members, including supervisors, senior management, and colleagues. As a result of my study, I posit that, in psychosocial well-being culture, employees' mental health and well-being are supported by quality leadership, adequate work demands, appropriate work organisation, and supportive interpersonal relationships between colleagues as well as between employees and supervisors. Psychosocial well-being culture facilitates psychosocial risk management and proactive assessments, which ensure workers' mental health and support safety behaviour.

5 Conclusion

In this thesis, I aimed to identify potential predictors of care workers' and patients' safety and to develop a holistic framework for a positive safety culture. To that end, I posed the main research question (How can a positive safety culture be ensured in care institutions*?*) and four sub-questions:

RQ1. How do care workers perceive safety culture in Estonian care institutions?

RQ2. Which aspects of the working environment influence employees' safety behaviour?

RQ3. How do care workers' professional competences influence their commitment to safety?

RQ4. How does psychosocial risk management influence employees' well-being and safety behaviour?

The previous safety culture concept does not allow safety behaviour to be explained explicitly and comprehensively. I differentiated safety culture into subcultures, which enabled me to analyse how safety culture is maintained in the context of complex social processes. I addressed the role of safety culture according to predictors of employees' safety behaviour arising from the multiple reciprocal components of safety culture defined as human, environment, and organisation. The human component has previously been underestimated in safety culture concepts and overshadowed by environmental and organisational components. Based on the differentiated perspective of safety culture, I implemented a multidisciplinary approach to safety research (Pillay, 2016; Quinlan, Bohle, & Lamm, 2010) and revealed the external (Aven, 2014; Klockner & Pillay, 2019) and internal (Heerkens et al., 2017; Hofmann & Mark, 2006) influences. The challenge lies in ensuring patients' and employees' safety and, at the same time, considering the social interactions and historical and cultural differences that shape the safety behaviour of care workers. In this thesis, I confirmed the results of previous studies (Agnew, Flin, & Mearns; 2013; Pousette et al., 2017; Wagner et al., 2018) that employees' and patients' safety are related to each other and should be integrated into the general management of the organisation and approached proactively.

Based on the above, I make the following theoretical contributions. First, I contribute to the study of safety culture by shedding new light on the perspective of safety culture differentiation. It has previously been noted that different groups in healthcare organisations could have their own interpretations of safety (Martin, 1992; Davis, Nutley, & Mannion, 2000; Mannion & Davies, 2018). I contribute by demonstrating that a differentiated approach is useful at the national level and makes it possible to determine the interpretations and meanings of safety among a group of professionals (Danielsson et al., 2014; Sirriyeh et al., 2012). I used a differential perspective to investigate the perceptions of one occupational group (i.e. care workers, nurse assistants) and to define specific aspects related to the safety behaviour of this group. From a management perspective, it is important to recognise the needs and the limitations of the organisation arising from the human component, not only at organisational level, but also at the state level. According to my research, care workers perceive that safety is not an organisational value, but rather a doctrine of national legislation. Unsafe behaviour is common and high safety-climate ratings do not reflect the actual level of safety (Article I). I consider care workers' interpretations of the meanings of safety as the product of historical memory, which can be explained through an anthropological approach to safety culture. My results support the notion that safety culture is a historically situated source for power and

business, which is continually produced through competing sets of interests (Keesing, 1994) and formed through experience and tacit knowledge (Geertz, 1973).

Second, differentiated perspectives allowed me to investigate the interaction of safety-culture components through defined subcultures: just; reporting; and learning (Reason & Hobbs, 2003). From a management perspective, it is important to recognise the challenges arising from the human component. I contribute to the position of Reason and Hobbs (2003) by adding two new subcultures deriving from the human component: professional competence culture (Article III); and psychosocial well-being culture (Article IV). I contribute to the defining of specific subcultures of safety culture for caring and nursing, which support the early diagnosis of SMSs' weakness and help to underline that subcultural diversity should be an essential part of any cultural identification in seeking quality improvement. Specifically, I revealed that there is a relationship between care workers' competences and commitment to safety and demonstrated the potential impact of safety knowledge on employees' safety performance (Article III). I also provided conceptual clarification on the role of psychosocial risk management in care institutions and its potential impact on employees' well-being and performance (Article IV). Finally, I proposed, based on the theory of situated cognition, that positive safety culture, especially subcultures such as professional competence culture and psychosocial well-being culture, influence care workers' self-image. This is key to ensuring adequate understanding and care workers' positive attitudes toward safety and encouraging their safety behaviour (Article III, IV).

Third, safety culture can be better seen as a paradigm of knowledge through the empirical investigation and understanding of the realistic descriptions of reality. According to Vredenburgh (2002), organisations with a positive safety culture experience a lower number of injuries and accidents. My results indicate that high safety-climate ratings do not reflect the actual level of safety (Article I) and that unsafe behaviour is common (Article II). I contribute to safety culture theory (Guldenmund, 2016) by adding new knowledge regarding analytical or psychological approaches to safety-culture research. I proved that a low number of injuries and accidents can also be connected with underreporting because of inadequate interpretations of employees' unsafe behaviour and inappropriate safety management (Zadeh, Rhaussmann, & Barton, 2018) (Article II). I explained this paradox through the anthropological approach to safety culture. Based on a differentiated approach, I used subcultures that reveal the external (Aven, 2014; Klockner & Pillay, 2019) and internal (Heerkens et al., 2017; Hofmann & Mark, 2006) influences and reflect care workers' inadequate interpretation of the meaning of safety. There are signs of post-Soviet influences that could be seen as obstacles to adopting the beliefs and values of high safety compliance.

My thesis makes several empirical contributions. First, I support previous findings that safety culture should be measured using a mixed methods approach (Denison, 1996; Flin et al., 2000). I contribute to existing knowledge by demonstrating that, in order to study complex phenomena in healthcare, a multidisciplinary approach (Pillay, 2016; Quinlan et al., 2010) and safety culture differentiation (Danielsson et al., 2014; Mannion & Davies, 2018; Sirriyeh et al., 2012) are needed. Safety culture differentiation should be seen from two main perspectives:

- Investigation of the specific and crucial groups within the organisation and their interpretations of safety. In my research, I investigated care workers' perceptions of safety.

- The periodical assessment of crucial subcultures (e.g. just, reporting, learning, professional competences, and psychosocial well-being) is required. I defined these as predictors of care workers' safety behaviour.

Second, the measurement of safety culture in care institutions should have a clear and shared understanding of OHS and patient safety goals (Davis et al., 2000). The periodical assessment of care workers' perceptions and the crucial subcultures are at the heart of the proposed holistic framework for safety culture as predictors of care workers' safety behaviour. Assessment, as the proactive approach of SMSs, should be implemented into the general management of the organisation. Additionally, the sustainability and proactivity of the proposed framework lies in defining action plans for continuous improvement and employees' involvement in patient safety and OHS management.

Third, I shed a new light into the existing usability and applicability of NOSACQ-50 and COPSOQ-II methods for evaluating and assessing safety climate and psychosocial well-being in the care institutions (Articles I and IV). In Article III, I assessed the relationship between professional and safety competences, as well as care workers' commitment to safety. I developed and tested the instrument Care Workers Competence Questionnaire (CCQ) for the study in order to identify the gaps in the existing care worker's competence and in their awareness of their role and responsibility in care services.

My thesis has some practical implications at both the management level in care institutions and the political level. First, the results from the current research could be useful for governmental agencies involved in healthcare and safety management. These results would also be beneficial for educational institutions (e.g. researchers, lecturers, students). The results can be used in creating guidelines with practical implications for safety specialists, supervisors, operations, and quality managers.

Second, to provide quality services in care institutions, SMSs should be proactive and supported by a positive safety culture. Safety culture it is not an independent phenomenon; it is rather a subculture of organisational culture that should be seen from the organisational and cultural perspective (Davis et al., 2000). To develop a positive safety culture, an evidence-based and multidisciplinary approach should be used, integrating complex evaluation packages. Previous studies have demonstrated that the role of managers is to develop safety measures, procedures, organisational structure, and a safe working environment, which ensure employees' safety behaviour. It is important to note that a positive safety culture is a way to ensure employees' safety behaviour. From a managerial point of view, designing SMSs should be based on knowledge of how different groups in organisations perceive safety. In my research, the differential perspective can be seen as an innovative approach to management and cultural theory; the proposed framework can also be considered an explanatory tool for dealing with complex safety challenges. This thesis identifies commonalities and the need to improve safety culture and safety climate, working environment, work organisation, as well as the psychosocial well-being and professional competences of care workers in a selected sample of Estonian care institutions. Of particular importance are the implications that these findings have both for safety culture and organisational science research. Hence, from a more practical standpoint, it is likely that managers in care institutions can benefit from a balanced approach to safety that includes several factors, including commitment to safety and employees' involvement, experiences, skills, and learning; special attention should be paid to creating a blame-free culture and a non-punitive environment in care institutions. The proposed framework, which served as a basis for the development

of the methodology, could be used as part of safety assessments, e.g. as a part of safety-management audits, which could help and support assessment of the safety climate and evaluation of the safety culture based on the defined subcultures.

Third, I developed several recommendations on how to supplement the existing educational curriculum and improve care workers' understanding of safety, as well as increasing their commitment to safety (Article III). I propose that, in the care workers' curriculum, a separate safety module should be developed and implemented. Care workers should acquire knowledge of safety culture and safety behaviour from the outset to raise their PI.

Fourth, I recommend complementing the programme for healthcare managers and increasing their knowledge of safety science, because supervisors and managers should know how to develop a culture of safety, why it is necessary, and how to measure and utilise safety-related data (Sammer et al., 2010).

Fifth, for operations and human resources managers, it is important to realise that the development of a professional competence culture is key to ensuring safety and providing quality services in healthcare; workplaces should create a network that increases the development of employees' PI and competences. Professional competence culture should be seen as the organisational capacity to value and use all opportunities from formal education systems and in-service safety training programmes to provide a life-long learning process within and outside the organisation.

Sixth, for operations managers, it is important to realise that promoting workplace mental health is a continuous process requiring appropriate management (i.e. continuous evaluation, prevention) involving the integration of employees' psychosocial well-being and interventions regarding MHPs into routine administrative processes (e.g. planning, staffing, directing, and controlling). Supervisors should increase employees' knowledge of how to reduce psychosocial risks and provide them with the necessary resources.

Finally, supervisors should develop guidelines for psychosocial risk management following the national strategic regulations. From the strategic perspective, it is also important to develop regional guidelines for promoting workplace mental health in healthcare based on international recommendations (e.g. WHO).

The originality of the studies underpinning this thesis lies in the usage of the data from a small open economy in Europe. However, as all the data in the current study were gathered from a single country, Estonia, this poses some limitations to the generalisability of the results. The first limitation concerns the subject under investigation being explored from the perspective of the employees. The results do not reflect the positions of the patients, the patients' relatives, or the employees' supervisors in relation to the questions addressed in this doctoral thesis. These perspectives deserve further attention in order to gain a comprehensive overview of the field encompassing different views, including those of patients, patients' relatives, employees, employers, and other stakeholders.

Second, there are methodological limitations. This study was not designed for the results to be generalised to other care institutions. However, the results are likely to have applications for other care institutions functioning in Estonia and are somewhat generalisable to other countries with similar legal systems, social systems, and common history. The quantitative data were self-reported, which might be affected by information bias and recall bias, especially in relation to the reporting of delicate and sensitive aspects, such as health complaints, occupational injuries, illness, and accidents

(Barling, Loughlin, & Kelloway, 2002). The qualitative data (the adoption of face-to-face focus-group interviews) also introduced potential interview bias and the potential influence of one or two respondents on the other members of the group.

Finally, regarding future research avenues, future studies can also adopt different safety-culture indicators, such as teamwork and the perceptions of supervisors and patients and their relatives, to examine and validate the proposed framework. There is a need for further investigation and development of the presented framework to explore in detail: the relationship between the safety climate dimensions, accident rates, and safety performance; and how care institutions, as organisations, can support collective learning in the context of SMSs, as well as in identifying the relevant organisational indicators of safety culture. Additionally, it is important to clarify the role of managers in the safety-culture measurement process and to define the main safety competences of safety managers in care institutions.

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Abstract

Safety culture framework for nursing and care institutions

This thesis was motivated by the need to create a new holistic framework for a positive safety culture in care institutions.

In light of the complex nature of safety culture, the current research focuses on the analysis of safety-culture subcultures. Safety culture has been defined as a key element in the provision of quality and safe services in healthcare, as well as in preventing accidents, incidents, and adverse events related to employees' and patients' safety (Chang et al., 2012; Kohn et al., 2000; Nilsson et al., 2014). In healthcare, leading indicators of a positive safety culture can be seen through appropriate attitudes, values associated with safety, employees' professional competences, and employees' willingness to work. In this thesis, safety culture has been described using a differential perspective in the context of subcultures as proposed by Reason and Hobbs (2003) for healthcare institutions (i.e. just culture, reporting culture, and learning culture). To investigate safety culture, safety climate (as a measurable component of safety culture) was assessed. Safety climate is defined as employees' perceptions of management dedication to safety norms, policy, procedures, and practices (Neal et al., 2000; Zohar, 2008) and is used to identify areas that need to be improved. The main challenges in this process are as follows: to ensure the provision of care services by qualified personnel; to enhance the safety climate; and to maintain workers' psychosocial well-being. All these aspects in healthcare are closely related to employees' ability to provide quality care.

According to Bondevik et al. (2017), there are lower levels of safety culture in nursing homes than in other healthcare institutions. This has been associated with a lack of employees' professional and safety competences, as well as a lack of management safety knowledge and commitment to safety (Almost et al., 2018; Dollard & McTernan, 2011; Vierendeels et al., 2018). Additionally, there is a lack of scientific evidence and empirical data, both regarding employees' perceptions of safety and the implementation of safety measures.

Based on above, the author's aim is to address this research gap. Therefore, **the aim** of my thesis is to identify potential predictors of care workers' and patients' safety and to develop a holistic framework for the positive safety culture concept from the perspective of healthcare and care institutions. The main research question was defined as follows: How can a positive safety culture be ensured in care institutions? More detailed objectives of this thesis are described in the following set of research sub-questions:

RQ1. How do care workers perceive safety culture in Estonian care institutions?

RQ2. Which aspects of the working environment influence employees' safety behaviour?

RQ3. How do care workers' professional competences influence their commitment to safety?

RQ4. How does psychosocial risk management influence employees' well-being and safety behaviour?

To answer these questions and achieve the study aims, the research process involved four studies conducted between 2014 and 2017. To investigate the four stages of the proposed safety culture framework, a sequential explanatory mixed methods study design was chosen, integrating an advanced design with a multistage evaluations

approach. Three of the four published papers (Articles I, III, and IV) utilised statistical data and analysis, and one paper (Article II) was based on qualitative data. A total of 19 institutions (33% of the population) that met the sample criteria (offering follow-up nursing, long-term care, rehabilitation, palliative care, and care for people with cognitive impairment) were approached to participate in the study. Four of the institutions chose not to participate, leaving 15 organisations in the final sample. Each research sample was selected according to cross-sectional principles.

I contribute to the study of safety culture by shedding new light on the perspective of safety culture differentiation. It has previously been noted that different groups in healthcare organisations could have their own interpretations of safety (Mannion & Davies, 2018). I contend that a differentiated approach is useful at the national level, enabling the interpretations and meanings of safety in a group professionals to be determined (Danielsson et al., 2014; Sirriyeh et al., 2012). I used a differential perspective to investigate the perceptions of one occupational group (i.e. care workers, nurse assistants) and to define specific aspects related to the safety behaviour of this group. From a management perspective, it is important to recognise the needs and limitations of the organisation arising from the human component. According to my research, care workers perceive that safety is not an organisational value, but rather is a doctrine of national legislation. According to Vredenburgh (2002), organisations with a positive safety culture experience a lower number of injuries and accidents. My results indicated that high safety-climate ratings do not reflect the actual level of safety (Article I) and that unsafe behaviour is common (Article II). I explain this paradox through the anthropological approach to safety culture. Based on a differentiated approach, I utilised subcultures that reveal the external (Aven, 2014; Klockner & Pillay, 2019) and internal (Heerkens et al., 2017; Hofmann & Mark, 2006) influences and reflect care workers' inadequate interpretation of the meaning of safety. I contribute to safety culture theory (Guldenmund, 2016) by adding new knowledge concerning analytical and psychological approaches to safety culture research. I demonstrate that the low number of injuries and accidents can also be connected with underreporting because of inadequate interpretations of employees' unsafe behaviour and inappropriate safety management (Zadeh et al. 2018) (Article II). There are signs of post-Soviet influences that can be seen as obstacles to adopting the beliefs and values associated with high safety compliance. My results show that safety culture is a historically situated source for power and business, which is continually produced through competing sets of interests (Keesing, 1994) and formed through experience and tacit knowledge (Geertz, 1973).

Additionally, differentiated perspectives allowed me to investigate the interaction of safety culture components through defined subcultures: just, reporting, learning (Reason & Hobbs, 2003). From a management perspective, it is important to recognise the challenges arising from the human component. I contribute to the position of Reason and Hobbs (2003) by adding two new subcultures deriving from the human component: professional competence culture (Article III); and psychosocial well-being culture (Article IV). I contribute to the definition of specific subcultures of safety culture for caring and nursing, which supports the early diagnosis of weakness in SMSs and helps to underline that subcultural diversity should be an essential part of any cultural identification in seeking quality improvement. I propose, following the theory of situated cognition, that positive safety culture, especially subcultures such as professional competence culture and psychosocial well-being culture, influence care workers' self-image. This is fundamental to

ensuring adequate understanding and care workers' positive attitudes toward safety and encouraging safety behaviour (Articles III and IV).

I support previous findings that safety culture should be measured using a mixed methods approach (Denison, 1996; Flin et al., 2000). I contribute to existing knowledge by demonstrating that, in order to study complex phenomena in healthcare, a multidisciplinary approach (Pillay, 2016; Quinlan et al., 2010) and safety culture differentiation (Danielsson et al., 2014; Mannion & Davies, 2018; Sirriyeh et al., 2012) are necessary. Safety culture differentiation should be considered from two main perspectives: i) the investigation of specific and crucial groups within the organisation and their interpretations of safety; and ii) the periodical assessment of crucial subcultures (e.g. just, reporting, learning, professional competences, and psychosocial well-being). I define these as predictors of care workers' safety behaviour.

The measurement of safety culture in care institutions should have a clear and shared understanding of OHS and patient safety goals. The periodical assessment of care workers' perceptions and the crucial subcultures, as predictors of care workers' safety behaviour, is at the heart of the proposed holistic framework for safety culture. Assessment, as a proactive approach to the use of SMSs, should be implemented within the general management of organisations. Additionally, the sustainability and proactivity of the proposed framework lies in defining action plans for continuous improvement and employees' involvement in patient safety and OHS management.

To conclude my dissertation, I assert that, to provide quality services in care institutions, SMSs should be proactive and supported by a positive safety culture. Safety culture it is not an independent phenomenon; rather, it is a subculture of organisational culture that should be considered from the organisational and cultural perspective. To develop a positive safety culture, an evidence-based and multidisciplinary approach should be used, integrating a complex evaluation package. Previous studies have demonstrated that the role of managers is to develop safety measures, procedures, organisational structure, and a safe working environment, which ensure employees' safety behaviour. It is important to note that a positive safety culture is a way to ensure employees' safety behaviour. From a managerial perspective, designing SMSs should be based on knowledge of how different groups in organisations perceive safety. In my research, the differential perspective can be seen as an innovative approach to management and cultural theory, and the proposed framework can be considered an explanatory tool for dealing with complex safety challenges. The thesis identifies commonalities among, and the need to improve, safety culture and safety climate, the working environment, and work organisation, as well as psychosocial well-being and professional competences of care workers in a selected sample of Estonian care institutions. Of particular importance are the implications that these findings have both for safety culture and organisational science research. Hence, from a more practical standpoint, it is likely that managers in care institutions can benefit from a balanced approach to safety that includes several factors, including commitment to safety and employees' involvement, experiences, skills, and learning; special attention should be paid to creating a blame-free culture and a non-punitive environment in care institutions. The proposed framework, which served as a basis for the development of the methodology, can be used as part of the assessment of safety, e.g. as a part of safety-management audits, which can help and support the assessment of safety climate and the evaluation of safety culture based on defined subcultures.

Lühikokkuvõte

Ohutuskultuuri raamistik hooldusteenuseid pakkuvate asutuste näitel

Eakate hooldus Eestis on viimase kolme kümnendi jooksul palju muutunud. Ühinemine Euroopa Liiduga (EU) on kaasa toonud EU direktiivide täitmise nõude ning on seadnud hoolekandeasutustele uued kvaliteedinormid. Eesti on tüüpiline EU riik, kus on tuvastatud järgmised puudused: nõrk komplekshooldus, professionaalse hoolduspersonali puudumine, ebapiisav finantstagatis, negatiivne psühholoogiline mõju töötajatele (läbipõlemine, residentide vaimne ja füüsiline vägivald jne) ning kutsehaiguste ja tööõnnetuste kõrge arv (Scheil-Adlung, 2015; TNS Emor & PRAXIS, 2015). Samas on elu- ja töötingimused hoolekandeasutustes siiani mõnevõrra mõjutatud Nõukogude Liidu pärandist (Habicht et al., 2018), mistõttu EU kvaliteedi- ja ohutusstandardeid ei ole täiel määral integreeritud (Järvis, 2013). Õiguskantsler on varasemalt tuvastanud hoolekandeasutustes toimunud auditeerimiste käigus olulisi inimõigusi puudutavaid kõrvalekaldeid, mis on seotud hoolekandeasutuste elanike elukvaliteediga (Madise, 2015). Eelpoolnimetatule tuginedes defineerin vajaduse tuvastada, millised faktorid ja asjaolud mõjutavad hoolekandeasutustes hooldusteenuste kvaliteedi tagamist ning milliste sekkumisstrateegiate baasil on võimalik hetkeolukorda parandada.

Eakate õigus väärikale elule on ülemaailmselt olnud paljude viimaste poliitiliste muudatuste keskmes. Tänaseks on leitud, et nii tervishoiu- kui ka sotsiaalhoolekandesüsteem vajavad muudatusi ja uuenduslikke lähenemisviise. Sageli vajavad eakad korraga nii meditsiinilist tuge kui ka sotsiaalabiteenuseid ning seetõttu on koostöö tervishoiu- ja pikaajalise hooldusasutuse vahel vajalik, samas on leitud, et nimetatud asutustel esineb koostööraskusi. Tuginedes nimetatud asjaolule saab nentida, et multidistsiplinaarsete sotsiaal- ja tervishoiumudelite väljatöötamine on möödapääsmatu (Purdy, 2010), kuna töötajate ristkasutamine nimetatud valdkondades on tavakogemus ning organisatsioonide jaoks on oluline, et töötajatel oleksid sarnased hoiakud ja väärtused, mis väljenduvad ühtses organisatsioonikultuuris.

Ohutuskultuur on võtmetegur, mis aitab tagada ohutu ja kvaliteetse teenuse. Kõrge ohutuskultuuriga organisatsioonides on töötajad pühendunud ohutusele, nendes juhtub vähem tööõnnetusi ning organisatsiooni tulemused on kooskõlas seatud eesmärkidega. Flin (2008) pakkus oma mudelis välja, et ohutusjuhtimine mõjutab olulisel määral ohutusolukorda ja -taset organisatsioonis ning madala ohutuskliima tulemuseks on negatiivsed juhtumid ja vead nii töötajate kui ka patsientide seisukohast lähtuvalt. Reason ja Hobbs (2003) pakkusid oma mudelis välja, et tervishoius sõltub ohutus järgnevatest ohutuskultuuri subkultuuridest: õiglus, raporteerimine ja õppimine. Käesolevas doktoritöös arendan antud teooriat, lähtudes arusaamisest, et ohutus ja pakutavate teenuste kvaliteet sõltuvad töötajate käitumisest. Organisatsiooni seisukohast lähtuvalt on oluline luua kultuur, mille tulemusel kõik liikmed on pühendunud ohutusele ning rakendatud on kõik ennetusmeetmed, mille kohaselt on tagatud töötajate ja residentide füüsiline ja psühholoogiline heaolu.

Uurimistöö eesmärk on luua holistiline tervishoiu- ja sotsiaalhoolekandeasutuste ohutuskultuuri raamistik, mis põhineb potentsiaalsetel ohutust ennustavatel teguritel ning soodustab hooldustöötajate ning patsientide/klientide ohutust ja heaolu.

Põhiline uurimisküsimus on: *Kuidas tagada positiivne ohutuskultuur tervishoiu- ja hoolekandeasutustes?* Lisaks on moodustatud uurimust toetavad alaküsimused:

1. Kuidas tajuvad hooldustöötajad ohutuskultuuri Eesti hooldusasutustes?
2. Millised töökeskkonna aspektid mõjutavad töötajate ohutuskäitumist?
3. Kuidas mõjutavad hooldustöötajate professionaalsed pädevused nende pühendumist ohutusele?
4. Kuidas mõjutab psühhosotsiaalsete riskide juhtimine töötajate heaolu ja ohutuskäitumist?

Püstitatud eesmärgi saavutamiseks viidi perioodil 2016–2017 läbi neli uuringut, milles osales kokku 23 tervishoiu- (7) ja sotsiaalhoolekandeasutust (16). Ohutuskliima uurimiseks kasutati küsimustikku NOSACQ-50, psühhosotsiaalsete riskide mõju uurimiseks COPSOQ-II. Hooldustöötajate hariduse ja ohutusalase pühendumuse vahelise seose mõõtmiseks töötati välja vastavasisuline instrument (Artikkel III). Töökeskkonna mõju ja käitumise vahelise seose väljaselgitamiseks viidi läbi fookusgrupi intervjuud.

Tulemused näitasid, et hooldustöötajad hindavad ohutuskliimat kõrgeks, kuid see ei peegeldu nende käitumises. Vigadest õppimine ja vigade registreerimine ei ole levinud praktikad Eesti hoolekande- ja tervishoiuasutustes. Olulisteks takistavateks teguriteks on hirm karistuse ees ning stigmatiseerimine. Uuringu tulemused näitasid, et hooldustöötajad tajuvad kõrget töökoormust, mis mõjutab nende vaimset tervist ja võimalikke töötulemusi.

Doktoritöö põhipanus organisatsioonikultuuri teooriasse on diferentseerimise käsitluse uus tõlgendus. Varem on märgitud, et tervishoiuorganisatsioonide erinevatel rühmadel võib olla oma ohutuskultuur (Mannion & Davies, 2018; Danielsson jt, 2014; Sirriyeh jt, 2012). Doktoritöö tulemusena selgus, et ka riiklikult ühel erialaspetsialistide rühmal võib olla sarnane ohutuskäsitlus ja -kultuur. Uurimistöös uurisin ühe ametirühma (hooldustöötajad, abiõed) arusaamu ja määratlesin selle rühma ohutuskäitumisega seotud konkreetsed aspektid. Juhtimise seisukohast on oluline tunnistada organisatsiooni vajadusi ja piiranguid, mis tulenevad inimkomponendist. Uurimistulemuste kohaselt tajuvad hooldustöötajad, et ohutus ei ole organisatsioonis väärtus, vaid pigem riiklike õigusaktide doktriin. Antropoloogilise ohutuskultuuri vaatest on oluline postsovetlikus ruumis arvestada hoiakute ja käitumise vahelise võimaliku ebakõlaga. Doktoritöö teiseks panuseks on Reason ja Hobbs (2003) lähenemise täiendamine. Lisaks järgmistele ohutuskultuuri subkultuuridele: õiglus, raporteerimine ja õppimine peab tervishoiu- ja hoolekandeasutustes looma professionaalse kompetentsi ja psühhosotsiaalse heaolu kultuurid. Pakutud ohutuskultuuri raamistik loob eelkõige subkultuuride keskse pideva hindamise ja täiustamise kaudu eelduse töötajate ohutuks käitumiseks ning seeläbi kvaliteetse teenuse pakkumiseks.

Kolmandaks oluliseks panuseks on läbikatsetatud instrumentide valik, millega on võimalik ohutuskultuuri hinnata multidistsiplinaarselt.

Töö kannab endas ka praktilist väärtust. III artikli kohaselt on soovitatud täiendada hooldustöötajate õppekava iseseisva ohutusmooduliga, mille tulemusel kasvaks töötajate arusaam ohutusest, ohutuskäitumist mõjutavatest teguritest ning tagajärgedest. Kasutusel olev mudel ei käsitle teemat kompleksselt. Töötajate ohutuspühendumuse ja soorituse parendamiseks erialase haridusprotsessi alguses on vajalik tervikvaade, mis annab erialase identiteedi kujundamiseks positiivse ja tugeva aluse. Oluliseks sisendiks on tervishoiu- ja sotsiaalhoolekande juhtide koolitusprogrammi täiendamise soovitus, mille kohaselt juht peab oskama hinnata ohutuskultuuri ning tõlgendada mõõtmisinstrumentide tulemusi. Lisaks sellele peab juht oskama koostada

vajalikke tegevusplaane olukorra parendamiseks ning paranduste elluviimiseks. Juhil peavad olema lisaks ka teadmised psühhosotsiaalsete riskide mõjust töötajate vaimsele tervisele ning arusaam, kuidas negatiivsed ohutegurid mõjutavad töötajate käitumist ja töötulemusi.

Ohutuskultuur tervishoiu- ja sotsiaalhoolekandeasutuses peab olema proaktiivne, selle loomine sõltub organisatsiooni töötajate hoiakutest, pühendumusest, professionaalsusest, füüsilisest ja vaimsest seisundist. Juhtide ülesanne on teadvustada, et kvaliteedi üheks indikaatoriks on nii töötajate kui ka residentide ohutus. Ohutuse käsitlemine sõltub juhtide ettevalmistusest, organisatsiooni juhtimise põhimõtetest ja organisatsioonikultuurist, kus ajaloo ja kultuuri tundmine on omal kohal ning ei tohi unustada antropoloogilist pärandit.

Appendix

Publication I

Sepp, J. (2018). Development of a reciprocal health care model for determination of safety level in the nursing homes in Estonia. *European Journal of Economics and Business Studies, 4*(3), 122–130.

Development of a Reciprocal Health Care Model for Determination of Safety Level in the Nursing Homes in Estonia

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Abstract

The aim of the current paper was to assess the care workers' psychosocial and physical health; patient's safety and examine the variations of care workers' working conditions in the national nursing homes. The NOSACQ-50 questionnaire was used as a research method. The majority of the care workers in nursing homes complain about physical pain, especially low back pain, and work-related stress. The study results show, that several specific features, such as management safety priority, commitment and ability, are found to influence the six dimensions of safety climate. Based on these results, the importance of good communication practices, management commitment and effective safety training to ensure a strong safety climate and safe behaviour among health care workers is highlighted. Mutual support from the employers to the care workers is needed to create safety as an organizational value. Thus, an effective assessment tool for the evaluation of safety level in nursing homes could be proposed based on the results of this study. The current paper presents a Reciprocal Health Care Model for determination the levers of safety improvement in nursing homes. The model refers to the importance of management safety priority and abilities as well as peer safety communication and trust in the safety ability.

Keywords: health care, safety climate, psychosocial health, physical health, workplace safety

1. Introduction

Theoretical Basis

The health care sector hires a large number of employees with high health risks. Healthcare workers are also at risk of suffering many different types of harm on the job. Even the fatal accidents of employees are possible, but the number of nonfatal occupational injuries, illness and absences are more common, particularly in the nursing homes of ageing people (Tullar *et al.,* 2010). Most of the health care risk managers look forward to the opportunities ahead and are dedicated to managing their organization's risk and enhance patient's safety. Additionally, workers' occupational health and safety (OH&S), which has impact on patient's safety, need to be emphasized. Previous research has also demonstrated that the level of workers' physical and mental health can influence patient's well-being (Flin, 2007). The healthcare systems across the globe continue to experience persistent and unsettled changes, reforms and improvements. The opportunities for healthcare specialists, particularly nurses, to provide effective and visionary leadership to address the challenges and consequences of the system reform have never been greater (Duncan *et al.,* 2014). Economic controls that cause demands for the new models of care in hospitals in order to reduce costs (Aiken & Patrician, 2017) are significant in many countries and contribute to a climate of increased management (Duncan *et al*., 2014). Persistent concerns about nurses and leaders shortages (Titzer *et al.,* 2014) along with complaints of overloaded and dissatisfied nursing workforces point to the importance of healthy and productive work environments in sustaining the health and well-being of nurses (McHugh *et al.,* 2011). Effective leadership practices to address these tasks should be informed by the current observed conclusions of the extraordinary effects of nursing management styles on nurse outcomes. Safety management challenges within the different organisations were studied with a special focus on the safety culture, safety knowledge, interrelationships between safety management systems and organizational factors (Järvis, 2013).

It is common understanding, that health care workers in the nursing homes face a wide range of OH&S hazards causing infectious diseases, musculoskeletal disorders, chemical-induced disorders and stress-related illnesses (Andre *et al.,* 2016). Many of them experience fatigue, because of the long shifts and heavy physical work, mental stress, lack of balance

between work and family and physical pain – factors that may pose a serious problem, not only for workers' well-being, but can also decrease their ability to provide good quality of patient's care (Yassi & Hancock, 2005, Sundin *et al.,* 2011; Sepp *et al*., 2015; Andre *et al.,* 2016). Previous research has illustrated, that the work of nurses and care workers in the Estonian hospitals and nursing homes is physically and mentally stressful (Sepp *et al.* 2015). It is clear that supportive environment in the organisation is essential in order to maintain employees' health and motivation, learning and innovation (Kivimäki *et al*., 2010). Yassi and Hancock (2005) describe a number of studies showing that interventions designed to reduce health care workers' injuries and illness also have positive effects on patient's safety. Katz-Navon with colleagues (2005) state that health care sector has several unique characteristics comparing with other sectors. First, the working environment in health care sector is complex in terms of job and task characteristics and involving high risks. Second, working environment affects not only workers' safety and well-being, but also patient's safety, what is the highest priority in health care sector. In addition, workers' safety behaviour is generally controlled not only by the health care organization, but also by the health care professionals' (nurses, supervisors and physicians) authorities.

Knowing the safety climate ingredients in the organization, there is a possibility to improve the safety system and safety level (Manoukian, 2017), particularly in nursing homes. The research literature discusses several approaches to developing a positive safety culture and climate as well as possibilities to enhance it (Järvis, 2013). At the same time, relatively little is known how healthcare organizations influence and deal with the formation of safety climate with respect to workers' psychosocial and physical health as well as patient's safety. Despite multiple attempts to explain safety climate through competing models, there is limited empirical research to substantiate which dimensions of the safety climate and organisational safety practices have the most demonstrative impact on safety performance within the nursing homes.

In the light of the above arguments the aim of the present study was to assess the influence of different dimensions of safety climate on workers' psychosocial and physical health, patient's safety and examine variations among national nursing homes. In addition, the article intends to propose and to discuss a model for a positive safety climate and empirically to test this.

2. Materials and methods

The current study investigates the safety climate's level in different nursing homes in Estonia. The Nordic Safety Climate Questionnaire (NOSACQ-50) (Kines *et al*., 2011) was used for measuring safety climate. A simple random sample was selected from care workers employed at the 19 nursing homes in all four parts of Estonia. Four of the selected nursing home refused to participate in the study and thus, 15 nursing homes were included in the sample. The sample involves nursing homes, rehabilitation and follow-up health care organisations, and workers, who are providing home health care services.

The data were collected during the period of September–December 2016. The questionnaire was sent to 371 care workers and, 233 of them (representing 62.8 % response rate) fulfilled the questionnaire and participated in the study. The highest response rate was in the East (36.9%) and North (31.3%) parts of Estonia. The majority of the nursing homes involved in the study, were financed by the public health care system (46.7%). Table 1 contains additional background information of the participants in the study.

According to NOSACQ-50 questionnaire, the dimensions (Dim) of safety climate are described as follows:

Dim1 - "Management safety priority and ability" (The organizational priorities are largely communicated through the managers. Manager's behaviour would be a main source of the information. If the managers are perceived to be committed to safety and to prioritize safety in relation to other goals, safe behaviour would be expected to be rewarded, and thereby reinforced);

Dim2 – "Management safety empowerment" (One-way for managers to convey trust is empowering the employees. Empowerment is a delegation of power, and as such it demonstrates that trust workers' ability and judgement, and that managers value workers' contributions);

Dim3 – "Management safety justice" (Employee safety responsibility and safety behaviour would be positively influenced by management procedural and interactional safety justice, i.e. just treatment and procedures when handling accidents and near-accidents.);

Dim4 – "Workers' safety commitment" (Safety motivation is strongly determined by the leadership and safety standards of the leader, but also by the standards and group cohesion. Group standards and cohesion are also determined by safety behaviour).

Dim5 – "Workers' safety priority and risk non-acceptance" (Safety priority and safety commitment should be assessed regarding separately to management procedures and practice);

Dim6 – "Peer safety communication, learning, and trust in safety ability" (Communication and social interaction are necessary means for the creation of social constructs such as organizational climate. Reason (1997) pointed out a learning culture and a reporting culture as two of the constituting sub-climates. Hofmann & Stetzer (1998) suggested that management encouraging open communication on safety sends a strong signal on how safety is valued.).

Dim7 – "Workers' trust in the efficacy of safety systems" (The safety climate questionnaire that should assess perceptions of the efficacy of safety systems, but that this should be assessed together with other aspects of safety climate, suggested above) (Kines *et al*., 2011).

Table 1 General Information

Characteristics of the sample (*n*=233)	Category	n	%
Gender (*n*=233)	Female	225	97
	Male	6	3
	Non-specified	2	1
Age (*n*=233)	Group1(≥65)	27	12
	Group2 (55-64)	77	33
	Group3 (45-54)	72	31
	Group4 (35-44)	33	14
	Group5 (25-34)	18	8
	Group6 (≤24)	6	3
Language	Estonian	183	79
	Russian	50	21
Demographic/background	North part[1]	73	31.3
	West part[2]	52	22.3
	South part[3]	22	9.4
	East part[4]	86	36.9
Occupation	Group A-Care workers	215	92.3
	Group B-Administrative staff	17	7.3
	Non-specified	1	0.4

Nursing homes [1]in North with codes F,J,G,H,M; [2]in West with codes B,O,E; [3]in South with codes A,K,N; [4]in East C,D,I,L

The NOSACQ-50 questionnaire was used in the Estonian and Russian languages in order to explore the care workers' shared perceptions and opinions toward safety-related procedures and practices in the nursing homes.

The tool contains positively and negatively formulated 50 items using a four-point Likert scale: strongly disagree-1, disagree-2, agree-3, strongly agree-4. The mean score was calculated for each dimension, respondent and for the groups. A mean score over 2.5 was considered as a positive result, as this is the mathematical mean value of the highest and lowest score. In addition, respondents were asked to provide data about experienced occupational accidents and diagnosed occupational diseases as well as to report possible health complaints (for example, pain in neck, back, arms and knees). Respondents' opinion and perception towards patient's safety was assessed using a Likert five-point scale.

Additionally, the Nordic musculoskeletal questionnaire (Kuorinka *et al.,* 1987) was used for assessment the musculoskeletal complaints (pain in the muscles) of workers.

The analyses have been prepared using SPSS Statistics 22.0. The following statistical methods were used: correlation, *MANOVA* and Factor Analysis Principal Component method (Field, 2013).

3. Descriptive analysis

The occupational accidents and diseases rates among respondents were low (occupational accidents 5.6%, occupational diseases 4.3%); however, 76.4% of the respondents reported that their job is stressful and 82.8% of them reported that they have experienced physical pain in different body locations. In order to investigate health care workers' physical health, the average muscular pain locations according to the workers' age were examined (Table 2). The most frequently reported health problem (low back pain), was reported by 48.9% of the respondents.

Table 2 Pain complaints

Age	n	Neck pain (%)	Upper back pain (%)	Low back pain (%)	Arms' pain (%)	Knee pain (%)
≥65	27	18.5	33.3	22.2	29.6	22.2
55-64	77	35.1	22.1	48.1	37.7	40.3
45-54	72	38.9	26.4	56.9	31.9	22.2
35-44	33	45.5	30.3	48.5	15.2	15.2
25-34	18	27.8	11.1	55.6	16.7	27.8
≤24	6	16.7	16.7	66.7	16.7	50.0
Total	233	34.8	24.9	48.9	29.6	28.3

According to NOSACQ-50 questionnaire, the general results reflected positive outcome on different dimensions (Dim) of safety climate.

Dim1. Management's safety priority and ability

Dim2. Management's safety empowerment

Dim3. Management's safety justice

Dim4. Workers' safety commitment

Dim5. Workers' safety priority and risk non-acceptance

Dim6. Co-workers' safety communication, learning, and trust ability

Dim7. Workers' trust in the efficacy of safety systems.

The total scores according to NOSACQ-50 were the following (scale 1-4): Dim1–3.39, Dim2–3.49, Dim3–3.52, Dim4–3.57, Dim5–2.89, Dim6–3.52 and Dim7–3.61.

The comparison of the results of patients who felt pain according to the locations (Table 3) of the nursing home, it is possible to conclude that the results do not vary significantly. However, a slight tendency can be observed that the institutions in north part of the country have lower scores in Dim1, Dim2, Dim4, Dim5 and Dim6; thereby the Dim3 - "Management safety justice" had the highest score in the Estonian north part's nursing homes. Institutions in the east part of the country show the high scores in Dim2, Dim4, Dim5 and Dim7. In the west part of the country, the highest scores were followed in the dimensions 1, 2 and 6. The differences between the regions are too small to draw substantive conclusions based on the regional results. It is seen from the results, that Dim5 - "Workers' safety priority and risk non-acceptance" have the lowest score and Dim7 - "Workers' trust in the efficacy of safety systems" gained the highest score in all the regions. This result might be influenced by the way of thinking from the Soviet times, when the superiors, insured the security of the subordinates in full.

Table 3 Regional results of dimensions

PART	n	Dim1	Dim2	Dim3	Dim4	Dim5	Dim6	Dim7
North part	73	3.3	3.42	3.54	3.45	2.79	3.45	3.61
West part	52	3.45	3.52	3.51	3.62	2.87	3.61	3.53

South part	22	3.32	3.49	3.52	3.63	2.88	3.55	3.45
East part	86	3.43	3.52	3.49	3.63	2.98	3.52	3.69
Total	233	3.39	3.49	3.52	3.57	2.89	3.52	3.61

3.1 - The relationships between the safety climate dimensions, stress and patient safety

In order to explore psychosocial health in detail, we examined statistically correlations between stress and occupational diseases and accidents, muscular pain and patient's safety in the unit as well as in the organization in general. The opinion of the leadership and the care workers might be different about the safety level and the use of safety improvement possibilities; therefore, the leadership and the care workers were investigated separately.

Initial data was divided into 2 samples, based on the position of worker (care workers (n=215), group A; and administrative staff (n=17), group B). Correlations between dimensions and selected variables were calculated within the groups. The results indicate (Table 4) that the care workers (group A) who give a higher score to Dim3 - "Management safety justice" feel that patient's safety in their unit is higher.

The only significant correlation (p<0.05) for group A is defined between the parameters "Management safety justice" and "Patients' safety in their unit". Positive moderate correlations for the group B are detected between workplace stress and management safety priority and ability, empowerment and justice. Additionally, we can say that rating of patient's safety correlate with "Management safety empowerment". Study results also reveal that those administrative workers (group B) who find their work not very stressful, give higher scores to Dim1 - "Management safety priority and ability", Dim2 - "Management safety empowerment" and Dim3 - "Management safety justice". At the same time, workers who perceive the patient safety in high level in both – in their unit and within the organization, give higher scores to Dim2- "Management safety empowerment".

Table 4 Safety climate dimensions and correlation with perceived stress and patient safety

		Stressful job	Patient safety in the unit	Patient safety in the organization
Group A (n=215) Sig. (2-taled)	Dim3 Management safety justice	0.005	0.138* 0.048	0.104 0.151
Group B (n=17) Sig. (2-taled)	Dim1 Management safety priority and ability	0.566* 0.022	0.465 0.060	0.465 0.060
Sig. (2-taled)	Dim2 Management safety empowerment	0.570* 0.021	0.568* 0.017	0.568* 0.017
Sig. (2-taled)	Dim3 Management safety justice	0.570* 0.021	0.333 0.191	0.333 0.191

*Correlation is significant at p<0.05

There is a positive correlation at significance level 0.05 between the variables "stressful job" and "patient's safety" in the organization for the group A (r=0.163). However, this correlation (0.163) is very weak, so we cannot conclude that workers, who feel that their work is not stressful, give higher scores to patient's safety in the organization.

Table 5 describes the assessment for patient safety according to the different nursing homes in different Estonian regions. The average score (1-5 scale) for patients' safety in the unit is 3.69 and in the organization 3.66. So, there is no particular difference between the nursing homes in different regions of the country.

Table 5 Assessment of perceived patient safety

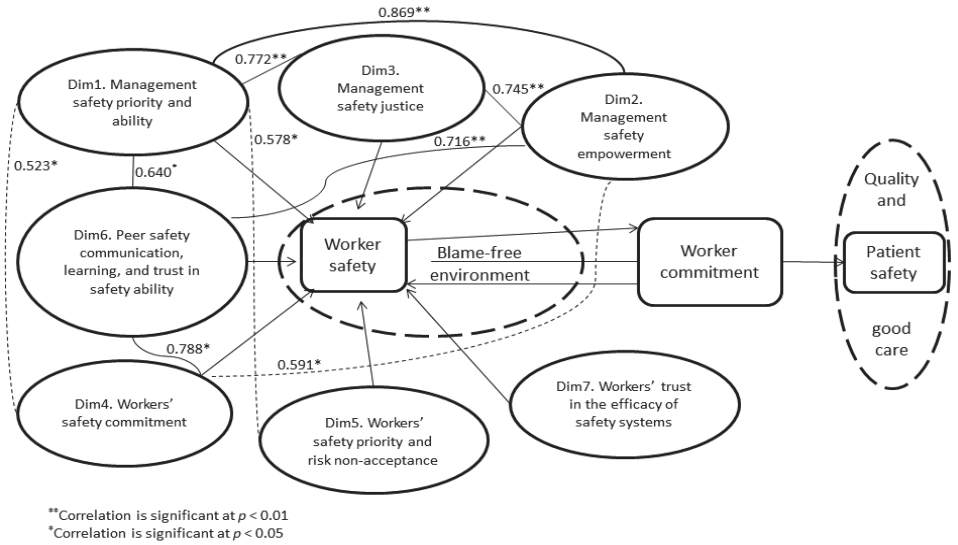
Part	Patient's safety in the unit	Patient's safety in the organisation
North	3.53	3.52
West	3.69	3.68
South	3.86	3.58
East	3.79	3.78
Total	3.69	3.66

3.2 - Development of a Reciprocal Health Care Model for improvement of safety climate in nursing homes

Based on the previous research in the nursing safety area (theoretical part of the current paper), the current research results and the correlations between the safety climate's different dimensions, a Reciprocal Health Care Model for Safety Climate (RHCMsc) has been developed. The model integrates the main reciprocal components affecting safety climate that enhance workers' safety commitment and also contribute to good patient's safety. Figure 1 demonstrates the relationship between workers' safety, workers' commitment and patients' safety.

The model proposed takes into account the dynamic interrelationships between different dimensions of safety climate, safety management systems (SMSs), safety behaviour and motivational strategies for safety knowledge exchange and learning within the organisation.

Figure 1. Reciprocal Health Care Model for safety climate (RHCMsc)



The author suggests that healthcare organizations should pay more attention to how create blame-free environment in the nursing in order to develop a positive safety climate and to change employees' safety behaviour.

Figure 1 demonstrates, that the main factors to create the blame-free environment in the nursing home and the positive safety climate, are "management safety priority and ability" and "management safety empowerment". Those factors ensure "workers' safety commitment" and improve "peer safety communication, learning, and trust in safety ability". The correlations between the different ingredients (dimensions) in the safety climate model are high. Exceptional is the Dim7 that do not suit to the model ("workers' trust in the efficacy of safety systems). If we "invest" into management's and care workers' safety knowledge, where the priority is good safety culture, the effective patient's care is guaranteed.

The further development of the model is needed in order to test the usability of it and to validate it. The author emphasizes that the vital part of the implementation of the proposed model is the proactive integration of safety management systems into organizational structure and processes as well as employers' commitment, employees' involvement in health and safety activities as well as their commitment to safety.

4. Discussion and Conclusions

In the light of the above arguments, the present nationwide study was the first step in the assessment of safety climate and relevant factors in Estonian nursing homes. The results of the study indicate that the care workers' job is psychologically and physically stressful. Earlier, Sepp *et al.* (2015) demonstrated similar results in the Estonian nursing homes. Our results showed that low back pain is reported as the main physical problem. From the other researchers, the musculoskeletal disorders of health care workers have been attributed in the large part to the patient's transfer and lifting activities (Hignett, 2003).

The results show that the care workers evaluate their safety climate higher than the patient's safety. The care worker is a key person in the nursing home and their safety behaviour depends on their perceptions and believes towards safety as well as shared values and norms within the organization. The results indicate that when the management is committed to safety and demonstrates that safety is a value and priority for the organisation, then workers' involvement in health and safety activities, safety decision-making process and good safety practice are increased. This result is supported by Kines *et al.* (2011) who concluded that if managers are perceived to be committed to safety and to prioritize safety in relation to other goals, safe behaviour would be rewarded, and thereby reinforced. This commitment can be reflected by the training programs, management involvement in the safety committees, consideration of safety in job design etc.

The results of the present study also demonstrate that the management plays the main role in order to improve safety climate in nursing homes. These results are in a line with Griffin and Hu (2013) who have found the certain leadership aspects that influence on safety behaviour, and Flin (2007) who has also revealed that one of the essential factors to the construct of safety climate in healthcare is the senior managers and supervisors' commitment to safety.

The results of the current study show that the number of reported occupational accidents and diseases in Estonian nursing homes is low. It can be explained by the underreporting in general (due to the various political and legislative shortages in Estonia) and by the fact that risk is perceived as a normal part of care workers' job and as the people tend not to report about minor accidents and near-misses. It is supported by our study results - low score of Dim5 (questions concerned attitudes to risk taking, considering minor accidents as a part of daily routine, accepting dangerous behaviour as long as no accidents occur, braking safety rules while on time pressure). Results by Eklöf *et al*. (2014) indicate the similar: if the management do not accept to consider the risks as a part of health care workers' job, then it does not support the improvement of workplace health and safety. Alameddine *et al*. (2015) found that the main barrier for improving safety and a high-quality care is a lack of mutual trust between employers and employees, which may cause hiding of errors and near-misses. West with the colleagues (2006) demonstrated that 'high-performance human resource managements systems, which include several essential aspects - workers employment security, investments in workers training, workers participation in decision making processes as well as relevant and adequate feedback to workers - facilitates better to their health, commitment and well-being'.

As the final result of the study in progress, the researchers developed a Reciprocal Health Care Model for safety climate which refers to the importance of management's safety priority and abilities as well as peer safety communication and trust in the safety ability. This is in a line with other researchers' results: e.g. Firth-Cozens (2002) states that effective leadership and line managers' commitment play a critical role in the maintaining of a good safety culture, commitment of workers (Laschinger *et al*. 2000), trust (Prause *et al.* 2013; Stulova *et al.,* 2017) and effective safety communication (Nadzam, 2009). Additionally, workers' professionalism, cooperation and support are essential for good safety in workplace and those factors promote workers' health, motivation, learning and innovation (Kivimäki *et al*., 2010).

Employers must pay close attention to risk analysis and risk assessment that affects both employees and nursing home clients (patients). Risk management and prevention are a proactive component of safety management.

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The Components of Non-Punitive Environment in Nursing

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Abstract **– In nursing homes, managers need to create work environment which considers patient's and worker's needs and helps the organization to respond to a complicated and changing environment. The aim of the study is to investigate the influence of working environment on care workers' safe behavior. We used KIVA questionnaire (characterizes the wellbeing workers). Our study reveals that in order to create the blame-free culture and non-punitive environment, the managers should pay attention to several factors: commitment, communication, leadership, collaboration, teamwork and learning.**

Keywords **– safety culture, safety climate, blame-free culture, non-punitive environment**

I. Introduction

Quality of patients' care in Estonian nursing homes is poor. Many problems are not identified, e.g. low level of complex care, lack of finance and educated staff, high level of workers' occupational accidents and diseases, care workers' overwork and burnout, violence of the patients against their own relatives and the nurses etc. (PRAXIS. (2015). Nursing homes have specialists from different disciplines (Pierce, 2000), specificity of organizations expect from workers flexibility, fast adaptation and managing changes without concessions in patient safety or quality of care (Ratnapalan & Uleryk, 2014). Nursing staff in long-term care (Woodhead *et al.*, 2014) includes employees who are working with elder people are often nursing assistants/ care workers/caregivers with a low level of education or no formal education (United States Department of Health and Human Services, 2006; Salonen, 2009), and the employers have themselves to organize training for the staff at workplace (RAKE, 2015). The quality of training is insufficient, the workers feel high level of stress and physical pain in different body parts (Sepp *et al.*, 2015). Musculoskeletal disorders are the main risk factor for care workers' health (Garg, 1999). It has been determined that in long-term care the safe patients' handling and lifting influences the staff as well as the patients (Trossman, 2007). Additionally, researcher Flin (2007) pointed out that both patients and workers could be injured in hospitals and nursing homes. We cannot address the safety of the patients and workers separately - we need to understand that by creating safe and supportive environment for workers we can also provide a better care for the patients (Sepp *et al.*, 2016).

The aim of the safety culture is to create a system where workers are informed about risks at their workplace (Ostrom *et al.*, 1993) and where all organization's members share the same knowledge and values of safety (Zohar, 2008), being committed to provide a quality care (Manser, 2009). To manage risks at the workplace, the organizations rely on systems to improve the quality. A safety management system can be described as a structure and set of processes, procedures, policies and actions, which are concentrated on minimizing the risks of work and work environment (Haight *et al.*, 2014). Previous study showed that work environment had an impact on the workers' behavior, motivation and attitudes. In health care units, the workers are more satisfied if they feel a friendly safety climate, reliable management, supportive teamwork and free collaboration of workers (Stone *et al.*, 2005). Safety climate is the assessing component of safety culture (Flin, 2007), which favours workers' shared values of safety (Zohar, 2008; Zohar, 2010), and relates with care workers and patients safety (Gershon *et al.*, 2000).

A. General Regulations of Communication, Commitment and Teamwork

Open communication is a supportive factor that helps to raise commitment to safety and correlates with the workers safety behaviour (Griffin & Hu, 2013). Communication is the most important part of the organizational being (Kines *et al.*, 2011). Open and reliable communication between workers and managers helps to provide safety (Zohar, 1980). Previous studies show strong relation between teamwork and patient safety with regard to open communication (Hamdan, 2013). To provide patient safety in health care organizations, it is vital to concern the accident reporting, give feedback and communicate on the mistakes and integrate the organizational learning to the system improvement (Ballangrud *et al.*, 2012). Management, teamwork and professional autonomy increase workers motivation, commitment and safety behaviour, helping to provide the patients' safety. If workers feel organizational commitment, they perceive that the managers are treating them fairly. In this concept, we can identify strong correlation between three components: training, learning and commitment (West et al, 2006). Workers' commitment to safety depends on the team goals where a shared expectation can predict high safety (Eklöf *et al.*, 2010). In addition, previous study shows that the supportive work environment increases commitment to work (Haggström *et al.*, 2010).

B. Management and Learning

The quality care and patients' safety depend on efficiency of the whole system, which promotes the organizations to learn (Ratnapalan & Uleryk, 2014). Goh *et al.* (2013) confirm that the organizational learning increases the collective knowledge and has a positive impact on creating the same value in the health care. It is essential to understand why accidents happened and errors were made, and how we can prevent them

in the future (Ratnapalan & Uleryk, 2014). Learning from mistakes is not easy in the medical sector due to workers' psychological barrier and their fear of being punished (Levinthal & March, 1993). Study by Lambert showed that safety culture helped to eliminate fear, provide a better collaboration between co-workers and prevent or minimize the risks and mistakes (Lambert, 2004). Open communication caused by the organizational learning strongly correlates with the workers' satisfaction and commitment. Workers perceive organizational commitment through treating them fairly and paying attention to their development needs by organized training (West *et al.*, 2006).

Strong relationship between employers and employees depends on the employee's commitment and is the most important factor affecting the workers' motivation and satisfaction (Robinson *et al.*, 2004). Workers may be discontent if their managers do not involve them in the decision-making process (Scott-Cawiezell *et al.*, 2006). Proactive actions help to prevent failures and promote the culture of safety (including reporting errors), facilitate organizational learning and ensure patient safety (Christensen *et al.*, 2000). The sharing decision to create an open communication increases trust between workers and employers and helps to create a blame-free culture (Scott-Cawiezell *et al.*, 2006). Management related to open communication, workers' job satisfaction, productivity and commitment is an important component of the work environment in nursing homes (McNeese-Smith, 1996). Based on previous research, the author has defined the components of blame-free culture Fig. 1.

Fig. 1. Components of blame-free culture and non-punitive environment.

C. Blame-Free Culture and Non-Punitive Environment

To provide a proper patients' care and safety of workers and patients, organizations need to create an environment where every mistake and accident is identified and recorded (Alameddine *et al.*, 2015). Managers should be convinced that patients live in safe environment, workers are protected and the provided services are of high quality (Manser, 2009). Wet *et al.* revealed that to provide a high-quality care in nursing homes, organizations should be reliable, have an adequate staff resources and managers able to be proactive and use preventive human resources management principles (West *et al.*, 2006). Organizational trust and justice based on the commitment, communication, learning, leadership and teamwork are the most important components to create safety and blame-free culture. Blame-free culture is an important step in progress towards the culture of safety (Scott-Cawiezell *et al.*, 2006). Blame-free culture is a component of non-punitive environment helping to create the patient safety culture. Thus the managers can increase the staff effectiveness. They use standards, transparency and ensure accident reporting in non-punitive and impartial environment. Open communication and teamwork are important in this process as they minimize the barrier between workers and managers and help to create a just culture (Harrington & Smith, 2015).

II. Method

Most previous studies have investigated the "Just Culture" or "Non-Punitive Culture" or "Blame-Free environment" where workers provide the best care possible and do their work safely for themselves and for the patients (West *et al.*, 2006; Alameddine *et al.*, 2015; Hamdan, 2013). Based on previous studies in this field, we defined the "Non-Punitive Work-Environment" as a comprehensive integrated approach of work environment, which is supported by commitments, communication and management, collaboration between the workers and the teamwork, where workers can learn from mistakes without fair to be punished. A simple random sample was selected from organizations involved in the previous study and on the following criteria: different size of the organizations, locations in different Estonian parts and availability of departments for patients with dementia and special needs, hospice and long-term care. Every code was made to protect participants' and organizations' anonymity and confidentiality. The interviews were conducted in Estonian and Russian languages. Data were collected during the period January 2016 to February 2017. We used KIVA questionnaire including seven questions. Previously used in the Metal Age programme (Näsman, 2013), KIVA is perfectly relevant for this purpose. We also added three questions connected with the work based on "The stress of conscience" (Saarnio *et al.*, 2012). Kiva questionnaire characterizes the wellbeing of workers at work. The ratings were given in a 10-point scale (1- not at all, 10- very much so, certainly or well).

A. Study Group

We had interviews with six groups of care workers from different nursing homes. 73 workers were questioned. The study group consisted of 4 men and 69 women.

TABLE I

PARTICIPANTS OF STUDY

Group	Size	Male	Female
Group A.	12	2	10
Group B.	16	1	15
Group C.	13	0	13
Group D.	18	2	16
Group E.	7	0	7
Group F.	12	0	12
Total	73	4	69

B. Study Design

We grouped the questions by six items: Commitment, Communication, Management, Collaboration, Teamwork and Learning. We used positive and opened questions from questionnaire according previously described items. Our study was focused on the interview guide incorporating a series of relevant themes to be covered during the interview, helping to direct the conversation. The interview was built as a picture of how workers work, collaborate with others co-workers, what they do when they make a mistakes or discover risks, how their managers make decisions etc.

We used a conventional content analysis. Data analysis started with reading all the data repeatedly to obtain impressions and the whole sense. Then we analyzed data word by word to derive codes by first highlighting the exact word from the text that appears to capture key thoughts or concepts. Most participants were women; each interview consisted of two parts, lasted about four hours and was recorded. Participants had a small break.

III. RESULTS

Two types of short questionnaires were given to nurses in the interviews. The first questionnaire (KIVA) was used to study the relationship between the employer and the nurses (support from the employer to decrease the stress of nursing workers and the physiological risk factors). The second questionnaire was used for study of relations between nurses and patients. The KIVA questionnaire (Harrington & Smith, 2015) consists of the following questions:

1. Have you enjoyed coming to work in the last weeks?
2. I regard my job meaningful;
3. I feel in control of my work;
4. I get on with my fellow-workers;
5. My immediate superior performs as superior;
6. How certain are you that you will keep the job with this employer?
7. How much can you influence factors concerning your job?

Questions in the second questionnaire for the nurses are called “The stress of conscience” and taken from (38) investigation:

1. How often do you lack the time to provide the care the patient needs?
2. Do you ever have to deal with incompatible demands in your work?
3. Is your work in health care ever so demanding that you do not have energy to devote yourself to your family as you would like?

The marks were given from 1 (not at all) to 10 (very much so, certainly or well). Our study reveals that workers perceived that they did not have control of their work and they were not involved in decision-making process. The answers to the questionnaire (mean data):

I get on with my fellow-workers: 9.2

My immediate superior performs as superior: 9.0

How certain are you that you will keep the job with this employer: 8.0

Have you enjoyed coming to work in the last week: 7.8

How often do you lack the time to provide the care the patient needs: 7.1

Do you ever have to deal with incompatible demands in your work: 6.7

I feel in control of my work : 6.5

How much can you influence factors concerning your job: 6.5

Is your work in health care ever so demanding that you do not have energy to devote yourself to your family as you would like: 6.1

The lowest marks were given to the possibility of influencing the factors concerning their work. The nurses are too tired to deal with the family as they wanted to; sometimes they have to deal with incompatible demands in their work. In every nursing home the nurses were interviewed so that they could speak about their main important problems. It appeared that the care workers in any nursing home considered the work too hard not so much physically (usually the patients are lifted by two or more persons) as psychologically. The question “is the work-day 10 hours too long for you?” was answered that time runs so fast as there is so much to do and the bells of patients are ringing all the time. Nurses in the capital city were not satisfied with conditions of remuneration while in rural areas nurses did not mentioned this fact since a nursing home was one of the few possibilities to get job.

The interviews reveal the key items and issues of “Non-Punitive Work-Environment” in nursing homes. We cannot find working environment which would meets the previously defined criteria of “Non-punitive work-environment”. In addition, nursing homes do not have the standards of quality care that would help to define the requirements of good care. Our respondents said that communication and collaboration

between managers and co-workers were very important but not always they could say that their supervisors supported them. Workers expect an adequate information from their employers. Care workers pointed out that they needed standards, instructions and overview of work, risks and work conditions. Besides, workers pointed out that they had no instructions how to use a special equipment or how to lift patients ergonomically, usually they are not informed about patients' special needs. Care workers pointed out that communication skills and practice demonstrated the level of organizational culture and helped to create a strong and trust relationship between patients and care workers.

"…If we do not have the standards of quality care, we cannot be efficient and do our job correctly…"

"…We do not have enough time and tools for every patient and it is connected with their satisfaction of the services and our motivation…"

Also important is the environment where care workers can discuss all problems and share useful suggestions with each other. Participants admit that they expect more information on the following subjects: how to cooperate with patients and how to behave with patients having special needs or approaches, how to manage conflict situations and how to help patient's relatives. Also very important is training about violence and managers' attitude to patient's aggression. In such cases the managers play a very important role. They have to provide and create an environment where employees feel themselves safe and supported. Managers cannot ignore violence at the workplace. They have to manage every episode and register them like occupational accidents. In addition, a formal training programme is needed.

Most participants pointed out that they needed a complex knowledge including specific attainments in anatomy, diseases, ergonomics, teamwork, communication skills etc. Besides, managers have to provide the required number of special equipment. Care workers also expect the standards and clear rules for provision of quality care. Our respondents pointed out that they needed to know how they could be efficient and which components had impact on their efficiency.

"…We know that we cannot provide good care and nobody asks our opinion in decision-making process, all decisions are taken without us…"

"…If we feel that our job is important, we are involved in decision-making process, it would create a feeling that our job is important for managers and patients and it motivates for better working and we want to do our job more efficiently.."

"…Managers do not want to spend more money for supplementary equipment; they suggest doing closer collaboration and share the belts with others colleagues. No one asks why we need more tools. It is humiliating to justify that you need a special equipment for patient lifting and transfer and you need it to provide a good care…"

"…We make and see mistakes every day but we cannot speak about them because we will be punished…"

"…If we can share our experiences with colleagues, we can minimize mistakes and uncomfortable situations in the future..."

"…We cannot speak about risks…"

"…Usually mangers think that we have breaks for coffee, they do not understand that our job is hard and we need breaks for recovery. And if we speak about it, managers take it as complaining..."

"…We expect more training in communication, patient lifting, ergonomics, hygiene etc.…"

We need to create environment where workers can learn at workplace every day, in every situation. Learning of patient's characteristics helps to promote a better understanding and trust between care workers and patients. Patients need to be informed about procedures. It increases confidence and creates a safe environment for the patient. In addition, it directly saves time resources and increases the efficiency of work. Care workers need to share their experiences with colleagues but they also need to be sure that if they did something wrong they would not be punished. Workers are ready to learn from mistakes if they know that they can trust the co-workers and the managers treat them fairly.

"…Trainings with co-workers at workplace help to see own or others' mistakes and analyze them together. In training situations we do not feel pressure and it helps to avoid the same mistakes in the future…"

"…When we share our experience, it helps us to understand patient's special needs. Patients are very different and need individual approaches. If we have enough information about patients, it makes care of patients easier and saves time for care procedures…"

"…We don't have discussions with colleges because employers do not pay to us for talking…"

Respondents pointed out that they needed to be briefed by managers how to prevent risks and musculoskeletal disorders and how to defend their own health. In addition, they pointed out that they needed to be supported by their managers and owners. The same attitude was expressed towards equipment: care workers know that in organization where they work they have necessary equipment but they do not know how important the use of lifting belts and other facilities is. Care workers have no information about ergonomics, physiotherapy, gymnastic and stretching, but they want to be proactive.

"...If I do not know how to use lifting equipment, managers think that it is our problem..."

"...When we discuss risks, we minimize the risks and dangerous situations in workplace..."

"… We want to know what kind of exercises we need to do for back stretching? We do not know that and our managers did not give us such information…"

"…We do not have opportunities to prevent health problems, especially back pain etc.…"

"...If we knew more about safety and ergonomics, we could share our knowledge and we would help the patients' relatives…"

In healthcare organizations, people work with different background and from multiple disciplines and who strive to provide safe and complex care (Ratnapalan & Uleryk, 2014). Non-punitive environment gives ethical opportunities for managers to create a standard-based work environment, provides high quality and reduces human research costs.

IV. Discussion

Our study shows that Estonian nursing homes need the standards of quality care. Care workers pointed out that regulations and descriptions of procedures help them to be efficient and carry out correct procedures. Safety of patients and their own safety is important also for workers. Workers pointed out that instructions needed to be integrated on the work level. Previous studies show that high-risk environment like hospitals and nursing homes need a system provided with regulations and instructions based on open communication and regular assessment of risks and safety climate (Flin, 2007; Parker, 2009). Safety climate is related with open communication and is a very important component of safety management and an impact factor in staff commitment to safety (Griffin & Hu, 2013). Workers prefer to speak about failures with their managers who gave them instructions and did not focus on the blame (Parker, 2009). Besides, our study demonstrates that workers expect from managers that they involve them in decision-making process. Workers need to know that they are of value for employers and they can influence their work and work environment. Olsen pointed out that managers needed to involve staff in decision-making process and concentrate their attention on being more flexible and proactive. This process should based on training, coaching, working with caregivers on special tasks etc. (Olsen, 2012). Managers need to establish relationships with workers where the staff feels support in every complicated situation and, if necessary, to involve specialists from external organizations and help workers to learn, be more confident, protected and efficient (Ratnapalan & Uleryk, 2014). Rosenbojm *et al.* (2014) have found that organizations' commitment to safety is associated with staff's perceptions of safety and their expectations. Management is very important and our study shows that workers have high expectations from their managers. Workers want to see that their managers are reliable, use modern human resources methods, appreciate workers and support them. Findings of previous study clearly demonstrate that workers feel comfortable with managers if they know that their problems will be solved and they can discuss their mistakes, problems and risks publicly, without subsequent punishment. Managers need to provide opportunities for the staff and create mechanisms to insure that they are a part of the team and are involved in decision-making process (Christensen *et al.*, 2000).

Our study demonstrates that workers need a strong collaboration between co-workers. Workers expect from each other a constructive feedback of their work and useful suggestions on efficiency. Caregivers see that at workplace they can share their knowledge and specific information about patients' condition and needs. This being the case, workers see the opportunities to learn from mistakes without blame or punishment. Hunter *et al.* (2010) show that if organization implements the training in ergonomic patient handling for workers, their skills improve and their motivation to provide proper care of patients increases, at the same time providing protection of caregivers' own health (Rosenbojm *et al.*, 2014). Previous studies show that workers' motivation increases when employees perceive that they can develop their professionality and are independent in work procedures (Van den Berg *et al.*, 2008; Van den Berg *et al.*, 2009).

V. Conclusion

The purpose of this study is to examine the influence of workplace work environment on safe behavior of care workers. In addition, we try to examine how managers support workers and create an environment where workers can learn from mistakes and provide quality and safe patient care.

Our study pointed out that managers' support and workers' involvement in decision-making process are the main impact factors for workers' motivation and commitment to safe behaviour. Open communication and strong teamwork increase workers' motivation and help to create a just culture. Besides, it helps team members to establish a strong teamwork and provide a better collaboration between workers.

Workers need standards that help to be efficient and minimize the probability of making mistakes. The learning component is critical for non-punitive environment. Quality of training and learning from mistakes are very important for workers. Correctly performed procedure/exercise takes less time and it is the main indicator in optimal organization of care workers' activity. Management of work process and time affects the quality of care and workers' health and is the most important component in provision of quality care. Care workers pointed out that at work they had no enough time, skills and knowledge, necessary resources like belts, dippers for each patient, and it had an adverse impact on quality, patient satisfaction and workers' commitment. To create non-punitive environment, managers need to integrate the management principles, cooperate with workers, define the shared goals and standards, communicate the problems, learn from mistakes and create a just and blame-free culture. Non-punitive environment is a key element to provide safety culture and quality care in nursing homes.

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Human factors and ergonomics in safety management in healthcare: building new relationships

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Abstract. Human factors are playing an essential role in ensuring occupational health and safety at work. In the healthcare sector, relevant factors include optimizing the interaction of humans with their technical, social working environment, and human characteristics such as knowledge and motivation. Those factors affect the ability to provide good quality of healthcare and safety performance. The aim of this paper is to analyse factors related to safety knowledge, communication and professional competence among caregivers in nursing homes. A group of professionals studied (n = 241, includes nurses and caregivers) completed a validated questionnaire. Descriptive statistics and correlation analyses were applied, using SPSS Statistics 24.

Our study revealed that over half of the respondents possess an occupational certificate and the majority of employers organize regular in-service training at workplaces. Respondents who claimed that in-service trainings are not regular still stated that they generally receive safety and ergonomic related trainings, trainings for working with special equipment. However, only a quarter of respondents have access to occupational safety trainings that focus on specific risks at work.

Based on the results of the study, we emphasize the need of integrating human factors in the safety management system in nursing homes with a special focus on adequate safety training in order to develop necessary skills and knowledge of workers. This would enhance employees' ability to cope successfully with the elderly and people with special needs, to provide safe and high-quality care as well as confidence and the knowledge how successfully they manage conflicts in order to keep good relationships at work.

Key words: competences, healthcare, training, workplace safety.

INTRODUCTION AND THEORETICAL BASIS

Human factors and ergonomics (HFE) are playing an essential role in ensuring occupational health and safety at work that influence workers and their behavior in work-related situations. The need for addressing those factors in healthcare has been recognised by many researchers (Hignett, 2003; Carayon, 2006; Hignett et al., 2013; Valdez et al., 2017). The main topics include optimizing the interaction of humans with their working environment (technical, physical, organizational and social working environment (team, supervisors, culture)) (Moray, 2000), human characteristics such as ability, knowledge, motivation of workers, and commitment to organization (Dul et al.,

2012). Management of HFE factors contributes to good quality of healthcare, improvement of patient safety (Carayon, 2010) as well as the prevention of occupational incidents and accidents within the healthcare organization. HFE focuses on the integrated system that includes interaction of humans with their working environment, and whereas in healthcare it is a complex system and environment (Carayon, 2006), focusing on both - on the employee (caregivers) and their safety as well as on a care receiver (patient safety) (Hignett et al., 2013).

In the healthcare, successful safety management within the organization requires the development of safety policies, procedures and structures, followed by the employees as well as a common understanding shared by senior managers and employees that safety is vital for overall performance. In addition, HFE tools and methods are also recommended by researchers (Goodman, 2010; Gutberg & Berta, 2017) as a part of interventions in order to improve patient safety.

The focus of HFE is generally on the improvement of well-being and performance by implementing a hierarchical approach. The improvement of the working environment through systems design is seen as the priority, followed by integrating the human into the system, selecting workers and an effective training that enhances social exchange and organizational learning (Christian et al., 2009) and creates a strong safety culture (Hadjimanolis & Boustras, 2013; Griffin & Hu, 2013).

In today's modern world, researchers emphasize the importance of the development of human resource, professional empowerment and competence of nurses and caregivers in healthcare systems in terms of safety and quality of nursing care (Heydari et al., 2016). Professional competency of nurses composed the central component of a set of skills, knowledge, attitudes, values, and self-efficacy (Levett-Jones et al., 2011), which can elevate nurses' and caregivers' positions among multi-professional teams within healthcare organizations. According to Chang et al. (2012), workers' competency is generally influenced by professional knowledge, reserved work experience, and personal attributes such as change skills, communication skills, qualifications, and experience (Chang et al., 2012) and is strongly related to errors and consequences (Axley, 2008). In addition, Epstein & Hundert (2002) revealed that professional competency might be evaluated according to correct judgment, practice and developed habits in terms of skills used, knowledge, clinical reasoning, shared values, communication, and daily activities.

Inside the organizations, continuous workers training plays also an essential role for health caregivers. The study by Nilsson with colleagues (2014) revealed that acquiring essential competencies by nurses is vital for the quality of everyday nursing practice. The competence level of nurses and training supports them to fulfil their duties effectively, safely, and directly influences the employees' and patients' safety, satisfaction with nursing care and conflict managements (Chan et al., 2014; Ahanchian et al., 2015; Heydari et al., 2016). Organizational learning, teamwork in the unit, feedback, learning from mistakes, communication and blame-free environment are strongly related to patient safety as well as to safety generally (Al-Ahmadi, 2009; Alswat et al., 2017). In healthcare, learning plays a vital role to offer a good quality of care (Ratnapalan & Uleryk, 2014). Legislation points out that training is a meaningful activity for risk prevention and safety and a key component that helps to the change workers' attitudes toward safety and understand their safety responsibility (Grau et al., 2002) and provide organizational effectiveness by HFE (Hignett, 2003; Carayon, 2006; Hignett et al., 2013; Valdez et al., 2017).

Development of professional competence of nurses is meaningful particularly for caregivers who are a part of the hospital system, representing it for patients and their family (Steginga et al., 2005; Ratnapalan & Uleryk, 2014) and providing patient care and living quests. Many scholars report that representatives of this specialty do not, in general. have professional and formal education and enough skills to provide quality care for elderly, sick people or for people with special needs (Salonen, 2009; USDHHS, 2014). Providing good care of patients often involves cognitively and physically difficult work with many work-related psychosocial risk factors, such as quantitative (work load) and emotional demands, workplace and role conflicts that may contribute to high levels of stress as well as burnout amongst nurses (Freimann & Merisalu, 2015). Chang et al. (2012) have found a strong relationship between safety prevention and health hazards, and between safety, health training in a healthcare organization.

Despite many healthcare studies that focus on the efficacy of treatment and practices as well as the importance and relevance of HFE in healthcare, there is a potential for the development of professional competence of nurses and caregivers. In this respect, lack of attention to professional competency of nurses and caregivers can cause problems for healthcare organizations, for example, nurses' poor competency may lead to some undesirable consequences, including nurses' frustration, job dissatisfaction, low job attitudes, including lack of organizational commitment and professional affiliations (Dul, et al., 2012; Hignett et al., 2013; Rajabipour Dehghani, 2013). For those reasons, it is relevant to investigate how human factors are integrated in the current safety management system in healthcare, particularly in nursing homes, in order to understand the interactions among humans and other elements of the system. We examined the relationship between caregivers' professional competency, obtained education and maintained qualifications, safety knowledge, communication, and commitment to safety.

In this article, we share Carayon' (2010) concepts and consider HFE as an innovation that each healthcare organization requires. In particular, focus is on general HFE knowledge provided to its workers, and follows an analytical framework proposed by Carayon et al. (2006) to consider how different components of the system can influence employees' commitment, attitudes and perceptions towards safety in a healthcare organization.

The aim of this paper is to analyse factors related to safety knowledge, communication, commitment to safety and professional competence among nurses and caregivers in nursing homes. We presume that the study will contribute to designing an interactive learning environment, an effective safety training and learning possibilities to integrate HFE into the in-service training activities in healthcare organizations.

MATERIAL AND METHODS

The study group

A simple random was selected from caregivers employed at seven nursing homes in Estonia. In total, 362 questionnaires were sent to nursing homes. The respond rate was 66.6%. Demographic data of the sample are presented in Table 1. It shows that among 241 respondents, 3 or 1.24% were males while 236 or 97.9% were females; information about the gender of one respondent is missing (0.8%). The distribution of respondents according to their age groups shows that 95 employees, composing 39.4%, are in the age group 48–57, followed by 56 employees or 23.2% who are in the age group 58–67,

44 respondents or 18.3% and 29 respondents or 12.1% are in the age group 38–47 and group 28–37, respectively. The rest of 7.1% respondents were spread between the group 18–27 (10 respondents or 4.2%) and the group older than 68 (6 respondents. 2.5%), 1 answer is missing (0.4%). More than a half of the respondents (55.61%) are caregivers, the rest of the respondents are nurses (44.39%) who are engaged in care work in nursing homes.

Table 1. Background information of study participants (n = 241)

Demographic variables	Category	Frequency	Proportion
Gender *(n = 241)*	Male	3	1.24
	Female	236	97.93
	Missing	2	0.83
Age *(n = 241)*	18–27	10	4.15
	28–37	29	12.03
	38–47	44	18.26
	48–57	95	39.42
	58–67	56	23.24
	68 and above	6	2.49
	Missing	1	0.41
Occupation *(n = 241)*	Care givers	133	55.61
	Nurse	108	44.39

Methods

The data were collected during the period of January – May 2017. The questionnaire was compiled according to Estonian National Occupational Standard for Care workers (Level 4, the highest level for professional competence of caregivers in Estonia). In order to explore caregivers' perceptions for the educational preparation according to the caregivers' occupational standard that establishes the requirements for working in nursing homes. The questionnaire includes six scales: Scale1 'Necessary skills, knowledge in living quests and patient care'; Scale2 'Necessary skills, knowledge for coping with the elderly and people with special needs'; Scale3 'Communication skills'; Scale4 'First aid'; Scale5 'Professionalism'; Scale6 'Commitment to safety'. Scale6 is not included into the national occupational standard for caregivers. Therefore, we complemented the questionnaire with this issue. The questionnaire was tested in both languages (Estonian and Russian) in two different nursing homes, revised and changed according to the results of piloting.

Description of created scales

The current diagnostic tool was tested for validity and reliability (Table 2). Cronbach α is an estimator of internal consistency. Cronbach alpha provides an assessment of questionnaire consistency; however, values may vary from one, which means best reliability and reliability to zero, which means that reliability is missing. Table 2 illustrates the high and statistically significant reliability coefficient of the following factors: 'Necessary skills, knowledge in living quests and patient care', 'Necessary skills, knowledge for coping with the elderly and people with special needs', and 'Commitment to safety'.

Cronbach's alpha for Scale1 is 0.897, which indicates a high level of internal consistency for this scale. To measure the variable 'Necessary skills, knowledge in living quests and patient care', a combination of questions from 1 to 10 was selected. Cronbach's alpha for Scale2 is 0.877, which indicates a high level of internal consistency for the Scale. To measure the variable, the combination of questions from 11 to 17 was selected. Cronbach's alpha for Scale6 'Commitment to safety' is 0.845, which indicates a high level of internal consistency for the scale. To measure the variable, the combination of questions from 26 to 31 was selected. As the other scales: 'Communication skills', 'First aid' and 'Professionalism' are defined by short lists of questions, the Cronbach's alpha was not calculated for them. But the analyses of the correlation between the questions of these scales were conducted.

As Scale1, 2 and 6 have high and statistically significant reliability coefficient (Table 2), the results of variations of the questions for Scale1, 2 and 6 are described in detail below.

Table 2. Reliability coefficients of the questionnaire for Scales1, 2 and 6

Scale	Cronbach α	M	SD
Scale1. Necessary skills, knowledge in living quests and patient care	0.897	43.42	5.77
Scale2. Necessary skills, knowledge for coping with the elderly and people with special needs	0.877	30.13	3.906
Scale6. Commitment to safety	0.845	25.59	3.806

The results for all specific factors used in the questionnaire are presented in Table 3.

Table 3. Results for the specific factors entered into the analyses

		Scale1	Scale2	Scale3	Scale4	Scale5	Scale6
N	Valid	236	240	241	238	240	234
	Missing	215	211	210	213	211	217
Mean		4.34	4.30	4.09	4.12	4.31	4.27
Std. Error of Mean		.038	.036	.048	.046	.043	.042
Median		4.50	4.43	4.00	4.00	4.33	4.33
Minimum		1.70	1.43	1.00	1.33	1.33	1.00
Maximum		5.00	5.00	5.00	5.00	5.00	5.00

Multiple modes exist. The smallest value is shown.

Respondents' opinions and perception were assessed using a five-point scale. The analyses were prepared using SPSS Statistics 24.0.

All respondents were informed about the aim and procedures of the survey. Every effort was made to ensure the protection of the privacy, confidentiality, and anonymity of individuals and organizations participating in this study.

RESULTS AND DISCUSSION

The first section discusses our general findings, such as results of the analyses of data about the occurrence of occupational disease, workplace stress and availability of safety-related and other additional training among respondents. The second section presents the main results of the study, followed by conclusions and our recommendations.

General findings

Our results revealed that 14.6% of respondents have been diagnosed with occupational diseases, 10% have experienced an occupational accident and 87.9% of the caregivers and nurses claim that their job is stressful (Table 4). Another study conducted by Sepp et al. (2015) in Estonian nursing homes demonstrated that work intensity, lack of time and social support, as well as difficulties in communication with patients influence caregivers' health and well-being.

Our findings also showed that over half (51.7%) of the respondents possess an occupational certificate, which gives a strong reason to credit that those workers may succeed with patient care more effectively than workers without specific vocational training.

Table 4. Characteristics of occupational health and safety aspects among respondents (%, proportion of respondents)

Age group	Occupational disease	Occupational accident	Occupational certificate	Stressful work
Total	14.6	10	51.7	87.9
18–27	-	10	40	60
28–37	24.1	24.1	41.4	82.8
38–47	6.8	9.1	47.7	90.9
48–57	14.7	5.3	48.4	90.5
58–67	17.9	12.5	69.6	87.5
over 68	20	-	33.3	100

Concerning additional trainings reserved by the respondents, the results showed that the majority of employers (82.5%) organize regular in-service training at workplaces (Table 5). Employees who receive regular in-service trainings claimed that those trainings consisted of the following topics: occupational risk and safety, ergonomics, working with special equipment as well as general safety trainings (e.g., fire safety, emergency, evacuation).

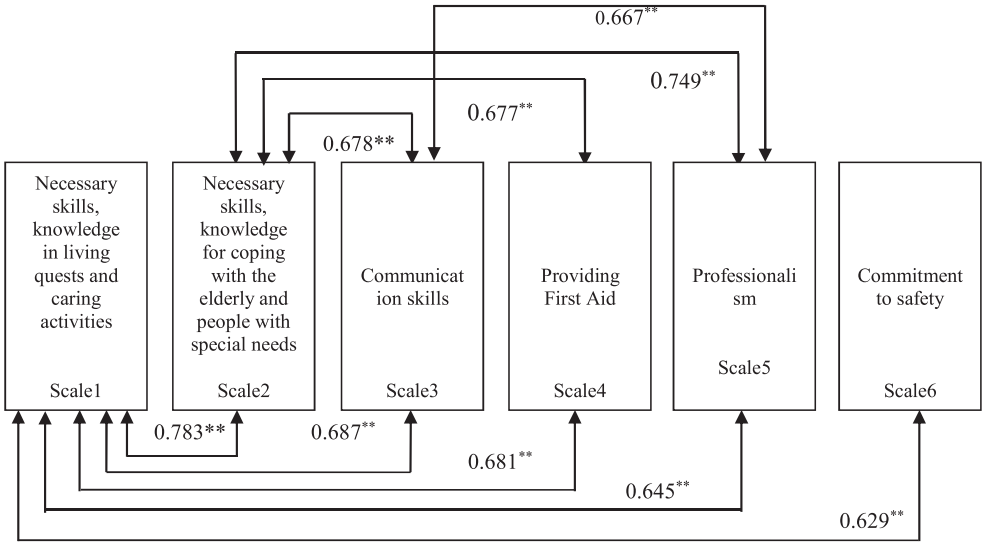
Table 5. Results about in-service trainings organized by employers (%, proportion of respondents)

In-service trainings	Respondents' rate
Employers organize regular in-service trainings	82.5
Employers organize occupational risk and safety trainings	79.5
Employees receive ergonomics-related trainings	75.8
Employees receive trainings for working with special equipment	82.9
Employers organize safety trainings (e.g., fire safety)	92.5

It is vital to have regular in-service training in order to strengthen safety behavior, commitment to safety and to improve knowledge about relevant requirement at work. Results of a study by Blair (2004) have demonstrated the core components of safety competency, such as ability to communicate effectively, to accept personal responsibility, to be able to implement and to transport solutions into action, to listen actively and to care, to assess and to evaluate safety effects, to maintain and to share a safety vision, to set goal, and to plan strategic actions. These competencies can be seen as an indicator for human resources development and management and for the development of safety and health training programs (Chang et al., 2012). Trainings for employees need to be planned carefully in order to be practical and effective, to be focused on employees' tasks and everyday work in order to improve workers' skills, performance and quality of working life (Orpen, 1993), their perceptions of quality and safety of care (Gurses et al., 2009).

Relationships between factors

According to our expectations, we found a strong positive correlation (r = .783) at significance level 0.001 between factors Scale1 'Necessary skills, knowledge in living quests and patient care' and Scale2 'Necessary skills, knowledge for coping with the elderly and people with special needs' (see Fig. 1). It means that respondents with higher estimation of their skills, knowledge in living quests and patients care have also higher confidence that they have enough skills, knowledge for coping with the elderly and people with special needs. Professional competency has been proposed as an essential element in the provision of healthcare also by other researchers, for example, Karimi et al. (2017) stated that developing professional competency and organizational commitment is essential for the high-quality and safety in healthcare.



**Statistical significance $p = 0.001$.

Figure 1. Correlations between scales.

In addition, Scale1 ‘Necessary skills, knowledge in living quests and patient care’ has also moderate positive correlations at significance level 0.001 with all other factors Scale3 ‘Communication skills’ (r = .687), Scale4 ‘First aid’ (r = .681), Scale5 ‘Professionalism’ (r = .645) and Scale6 ‘Commitment to safety’ (r = .629). Correlation between Scale1 ‘Necessary skills, knowledge in living quests and patient care’ and Scale3 ‘Communication skills’ shows that confidence in own knowledge and skills about patient care and living quests influences positively employees’ ability to communicate with patients and to find solutions for managing work-related conflicts. Correlation between Scale1 ‘Necessary skills, knowledge in living quests and patient care’ and Scale4 ‘First aid’ shows that employees who estimate their professional skills and knowledge higher than others feel more confident even in emergency situations. Respondents who perceive themselves as a professional with necessary skills and knowledge are more confident about their skills and knowledge also in living quests and patient care. This is confirmed by moderate positive correlation between Scale1 ‘Necessary skills, knowledge in living quests and patient care’ and Scale5 ‘Professionalism’.

Positive moderate correlation between Scale1 ‘Necessary skills, knowledge in living quests and patient care’ and Scale6 ‘Commitment to safety’ may be a reason why respondents who have high estimation of their skills and knowledge tend to be more committed to safety. Vice versa, employees who are more committed to safety have also higher estimation about their knowledge and skills in living quests and patient care. There is also strong positive correlation (r = .749) between factors Scale2 ‘Necessary skills, knowledge for coping with the elderly and people with special needs’ and Scale5 ‘Professionalism’. This means that employees with higher professionalism have higher estimations about their skills and knowledge for coping with the elderly and people with special needs. In addition, Scale2 ‘Necessary skills, knowledge for coping with the elderly and people with special needs’ has also moderate positive correlations with other factors, for instance, Scale3 ‘Communication skills’ (r = .678), Scale4 ‘First aid’ (r = .677), and Scale6 ‘Commitment to safety’ (r = .607).

Moderate positive correlations at significance level 0.001 were obtained between factors Scale3 ‘Communication skills’ and Scale1’ Necessary skills, knowledge in living quests and patient care’ (r = .687), Scale3 ‘Communication skills’ and Scale2 ‘Necessary skills, knowledge for coping with the elderly and people with special needs’ (r = .678), Scale3 ‘Communication skills’, and Scale5 ‘Professionalism’ (r = .667). This means that respondents with higher estimation of their professional knowledge are more confident in communication and willing to be able to solve conflicts more effectively than those employees who estimated those competences lower. These results prove the fact that effective training for health caregivers contributes to many critical aspects during work situations of caregivers and nurses. According to studies by Conner (2014) and Karami et al. (2017), continuous education is also recommended in order to strengthen professional competence of healthcare workers as well as to improve their confidence regarding everyday activities and practice (Orpen, 1993; Steginga et al., 2005), to improve their knowledge about safety, safe and direct patient-centred care (Lakanmaa et al., 2015) as well as enhance job satisfaction and commitment to organization. Another study (Han & Chung, 2015) has demonstrated that health caregivers’ organizational commitment is a vital precondition for the reduction of negative consequences, such as conflicts, exhaustion and turnover within health organization, as well as for mainenance

of friendly relationships with co-workers and of patients' health through a positve and supportive relationship to patients (deeper commitment to patients) ad to their families.

Factor Scale4 ‘First Aid’ has moderate positive correlations with factors Scale1 ‘Necessary skills, knowledge in living quests and patient care’ (r = .681) and Scale2 ‘Necessary skills, knowledge for coping with the elderly and people with special needs’ (r = .677) at significance level 0.001. It can be explained that respondents who have high estimation on their knowledge and skills in living quests and patient care, and on skills and knowledge for coping with the elderly and people with special needs are also more confident in their readiness to provide first aid. Respondents who have doubts about their skills and knowledge described in Scales1 and 2 have also doubts in their ability to provide first aid.

There is also moderate positive correlations at significance level 0.001 between factor Scale6 ‘Commitment to safety’ and Scale1 ‘Necessary skills, knowledge in living quests and patient care’ (r = .629), and Scale6 ‘Commitment to safety’ and Scale2 ‘Necessary skills, knowledge for coping with the elderly and people with special needs’ (r = .607) (Table 6). It shows that respondents who have sufficient knowledge and skills required for their work are more likely to contribute to effective cooperation with management and/or with other co-workers in questions related to occupational safety.

Table 6. Relationships between different professional competences of caregivers in Estonia

	Scale	Scale1	Scale2	Scale3	Scale4	Scale5	Scale6
S1	Necessary skills, knowledge in living quests and patient care		.783**	.687**	.681**	.645**	.629**
S2	Necessary skills, knowledge for coping with the elderly and people with special needs			.678**	.677**	.749**	.607**
S3	Communication skills				.593**	.667**	.563**
S4	First aid					.574**	.345**
S5	Professionalism						.536**
S6	Commitment to safety						

**Statistical significance $p = 0.001$.

Caregivers’ perceptions of their knowledge

Scale1 ‘Necessary skills, knowledge in living quests and patient care’ was measured in the questionnaire by 10 questions (questions 1 to 10). Parameter Scale1 in Table 7 summarizes the results of selected variables included into the factor. The mean of summarized Scale1 variable is 4.34, which is 86.8% of the maximum. The highest level in this scale has question 10, question 8 showed the lowest level. This means that respondents estimate highly their knowledge and skills on patient hygiene and coping in daily life, but they do not feel confident enough to organize patients’ social, rehabilitation and health services. These results indicate that in-service training and vocational training may not give sufficient knowledge to understand fully the system of healthcare with a large spectrum of different tasks, which would be essential in order to be able to give professional advice on clients’ special needs as well as to organize an appropriate patients’ activities by nurses and caregivers.

Table 7. Results of selected variables from Scale1 'Necessary skills, knowledge in living quests and patient care' of the caregivers' professional competences

Questions			Questions									
	Mean	SD	1	2	3	4	5	6	7	8	9	10
1 safe environment	4.32	.824										
2 nursing	4.48	.713	.634**									
3 theory to practice	4.39	.830	.488**	.698**								
4 patient knowledge	4.20	.785	.522**	.481**	.426**							
5 safe medicine taking	4.44	.795	.351**	.532**	.455**	.423**						
6 risk of medicines	4.30	.854	.391**	.449**	.431**	.460**	.746**					
7 helping the nurses	4.46	.737	.344**	.447**	.357**	.416**	.555**	.566**				
8 health services	3.94	.936	.382**	.324**	.368**	.471**	.417**	.457**	.507**			
9 relatives' consulting	4.26	.808	.453**	.488**	.453**	.559**	.493**	.585**	.434**	.541**		
10 patients' hygiene	4.58	.679	.374**	.569**	.446**	.420**	.523**	.449**	.449**	.356**	.487**	
Scale1	4.34	.577	.685**	.770**	.709**	.719**	.755**	.767**	.694**	.683**	.761**	.685**

**Statistical significance $p = 0.001$.

Scale2 'Necessary skills, knowledge for coping with the elderly and people with special needs' includes 7 questions (questions 11 to 17). The mean of the variable of Scale2 was 4.30 (86.0%) and standard deviation 0.558. It has strong uphill linear relationships with questions 12, 14 and 15. This means that respondents understand the importance of having a relevant skills and knowledge for coping with the elderly and people with special needs. There is moderate positive correlation at significance level p<001 between questions 14 and 15, which shows that respondents who have high skills in problem solving tend to know how to motivate elderly patient to try to manage his/her activities independently. In summary, the correlation presented in Table 8 shows that all questions have significance in relation to Scale2.

Scale6 'Commitment to safety' was measured in the questionnaire by 6 questions (questions 26 to 31) (Table 9). The mean of the variable of Scale6 was 4.33 (86.6%) and standard deviation 0.63. We found strong uphill linear relationships with questions 29, 27 and 28, which shows that respondents appreciate their participation and involvement in safety activities as well as the ability to discuss safety issues with management. The most significant correlation was found between questions 28 and 29 (r = .768) at significance level 0.01, which shows that respondents value the management willingness to discuss safety issues. In those cases, workers are motivated eagerly to inform about safety problems as well as to propose safety measures in order to deal with them. This is in line with the study conducted by DeJoy et al. (2017), which has clearly demonstrated that many occupational health problems are generally related to organizational factors.

Akroyd et al. (2007) have addressed the necessary core commitment factors, for example, perceived level of organizational support, management commitment, role of clarity and level of education. According to Farokhzadian et al. (2015), senior managers are responsible for safe working environment, promoting safety and quality care in healthcare organizations.

Table 8. Results of selected variables included into Scale2 'Necessary skills, knowledge for coping with the elderly and people with special needs' of the caregivers' professional competences

Questions/Keywords	Mean	SD	11	12	13	14	15	16	17
11. patients' coping	4.31	.741							
12. patients' daily life support	4.51	.640	.602**						
13. recognition of health problems	4.38	.709	.577**	.580**					
14. patient's problem solving	4.22	.707	.559**	.546**	.637**				
15. patient's independent	4.29	.729	.495**	.509**	.593**	.609**			
16. using the special equipment	4.22	.773	.455**	.571**	.403**	.504**	.515**		
17. work ergonomics	4.19	.830	.407**	.447**	.349**	.348**	.443**	.600**	
Scale2	4.3	.558	.765**	.787**	.768**	.781**	.780**	.767**	.691**

**Statistical significance $p = 0.001$.

Table 9. Results of selected variables included into Scale6 'Commitment to safety' of the caregivers' professional competences

Questions	Questions							
	Mean	SD	26	27	28	29	30	31
26 patients' safety discussions	4.31	.820						
27 safety communications	4.31	.816	.505**					
28 managers discussions	4.29	.861	.343**	.515**				
29 safety proposals	4.27	.816	.397**	.610**	.768**			
30 availability of equipment	4.10	.894	.402**	.512**	.476**	.482**		
31safety trainings	4.29	.834	.445**	.430**	.374**	.373**	.470**	
Scale6	4.33	.634	.684**	.793**	.777**	.807**	.761**	.685**

**Statistical significance $p = 0.001$.

In the analysis of relationships between specific statements, we found a few significant correlations (at significance level $p = 0.001$). The strongest correlations were found between questions 9 (Scale1) and 12 (Scale2) (r = .576), 15 (Scale2) and 17 (Scale2) (r = .559). These relationships mean that if respondents estimate their knowledge and skills highly, they provide good instructions of how to take care of

patient's regular needs, provide advice and instructions to the patient´s families as well as support and encourage patients with coping in daily life. In addition, respondents also estimate that they have good knowledge about ergonomics and how to do their job safely. Similarly, there is significant correlation between questions 10 (Scale1) and 12 (Scale2) (r = .546). According to the results, caregivers and nurses who are confident in their knowledge and skills to provide patients' hygiene, and do it safely and effectively, believe that they are also able to provide patients with good instructions for their daily activities.

Previous studies have extensively reported the numerous aspects related to competent and trained employees, such as better safety and health knowledge, skills and experiences (Chang et al., 2012). Additionally, educated and well trained employees tend to discuss safety issues with co-workers more frequently. They also have a better work process across time and better communication and information flow; in addition, they are good in coordinating problems (Horwitz et al., 2009). Another study (Koohi et al., 2013) has demonstrated that trained employees are more committed to organizations and more interested to become involved in the activities beyond their common and pre-determined duties. Our study confirms these previous findings.

In addition, our study showed that training programmes for professional caregivers and nurses should include more extensive knowledge about the general scope of the healthcare system to support competent advice in patients' social, rehabilitation and health services. In addition, more effective training is required how to provide adequate help in emergency situations.

Based on the results of our study, it is required to integrate human factors in safety management of nursing homes with a special focus on adequate safety training and development of necessary skills and knowledge of workers. We also emphasize the need to include the topic of patient safety and worker ergonomics into the national occupational standard as well as in vocational training programs/curriculum. Resulting from our study, we stress the importance of in-service trainings about specific occupational safety issues (e.g., how to use special equipment ergonomically). This would enhance employees' ability to cope successfully with the elderly and people with special needs, to provide safe and high-quality care, to stay confident and to manage conflicts in order to keep good relationships at work.

CONCLUSIONS

The results of our study prove that workers' knowledge, skills and beliefs are essential components for safety and quality in patient care. Resulting from the survey, we can conclude that employees with higher awareness of their professional competence have also higher estimations about their skills and knowledge for coping with the elderly and people with special needs. Respondents who highly estimate their knowledge and skills in living quests and patient care, skills and knowledge for coping with the elderly and people with special needs are also more confident and prepared to provide emergency first aid. We also found that respondents with higher estimation of their professional knowledge are more confident in communication and are able to solve work-related conflicts.

Our results reveal that caregivers and nurses who have high estimation of their skills and knowledge are more committed to safety. We found that respondents who have sufficient knowledge and skills required for their work are more likely to participate in health and safety activities, to discuss topics about occupational safety with co-workers as well as with management. Care givers and nurses who participated in our study emphasized the importance of management commitment to safety in order to be confident to discuss safety problems, suggest safety measures and improvement of working environment. Complementing the national standard with recommended issues (to include safety topic into the curriculum and organize the in-service training) will allow improvement of safety knowledge among caregivers and nurses and will demonstrate that patients' and occupational safety is a priority in all duties in healthcare. We suggest that HFE should be integrated into the in-service training activities in order to enhance safety performance and quality of patient care.

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Publication IV

Sepp, J., Järvis, M., & Reinhold, K. (2019). Assessment of psychosocial risk factors and their impact on health-care workers' mental health: An empirical study in Estonian nursing homes. *Research in Economics and Business: Central and Eastern Europe, 11*(1), 17−32.

Assessment of Psychosocial Risk Factors and their Impact on Health-Care Workers' Mental Health: An Empirical Study in Estonian Nursing Homes

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Abstract

According to the World Health Organization, the psychosocial work environment is one of the most important factors in preserving the wellbeing of healthcare workers and ensuring the quality of healthcare services. The psychosocial environment in healthcare is complicated and related to stressful work, high demands and working in shifts. The purpose of the study is to explore the relationships between work-related psychosocial risk factors and the mental health of care workers. The study used the Copenhagen Psychosocial Questionnaire, version II and the statistical analysis was performed using the SPSS 24.

Our results show that the work environment influences the mental health of care workers. Psychosocial hazards, such as low quality of management, lack of staff, role conflicts, low dedication among workers, physically and mentally challenging work and stress at work, are prevalent in the healthcare sector. The management of the organization including the management of safety issues should be proactive and oriented towards preserving the health of the employees and offering patient-centred services.

Jel classification: 123
Keywords: psychosocial risk factors, mental health problems, stress, burnout, healthcare, nursing home

1. Introduction

The field of healthcare has changed as a result of rapid technology developments during the last three decades. At present, a lack of the necessary staff is critical in the field of healthcare, and existing positions are being fulfilled by care workers with lower levels of vocational education, which in turn has a significant influence on the quality of the services offered and the sustainability of the institution due to unreasonable additional organizational costs (Titlestad et al., 2018).

It has been confirmed by the study by Rahman, Naing and Abdul-Mumin (2017) that problems concerning lack of staff may be related to the management of the organization and its prevailing work environment. A difficult psychosocial environment from the stressful work, high demands and working in shifts is most commonly highlighted in the field of healthcare (Toode, et al., 2015). The World Health Organization has named the psychosocial work environment (PWE) as one of the most important factors in preserving the wellbeing of healthcare workers and ensuring the quality of healthcare services (Rahman et al., 2017).

In the field of healthcare, the problematic psychosocial work environment is associated with the following factors: lack of staff, role conflict, low management quality, problems related to dedication, and the physical and psychological stress of the staff. The influence of the psychosocial work environment is measured in both employee and organizational terms. From another perspective, the psychosocial work environment due to high standards, efforts and unbalanced payment, and the inability to influence one's work has an effect on employees quitting their jobs (Li et al., 2010) and their incapacity to work, which results in increasing costs for the healthcare system and organizations and society (Rahman et al., 2017).

Based on the statements above, the objective of the current study is to explore the relationships between work-related psychosocial risk factors and four specific mental health problems in care workers (stress, somatic symptoms, symptoms of depression and burnout) in Estonian nursing homes. This study sets three research questions:

a) Which psychosocial hazards have a negative influence on the mental health of healthcare workers?
b) What is the impact of the mental health of healthcare workers on patient safety and the quality of the services offered?
c) How can psychosocial hazards be mitigated through social support and quality leadership?

The study used a cross-sectional survey conducted among the care workers in nine Estonian nursing homes in November 2017. The Copenhagen Psychosocial Questionnaire (COPSOQ II) was used. The study explored psychosocial risk factors and mental health problems (stress, somatic symptoms, symptoms of depression and burnout) among care workers in Estonian nursing homes.

This article is organised as follows: Section 2 provides a literature review addressing the management of occupational safety in the healthcare sector, the safety culture and safety management systems in nursing homes, and safety climate assessment as a safety performance antecedent. Section 3 describes the methodology of the study. In addition, the instrument and test sample used and methods of data analysis are described. Section 4 presents the results of our research. In the last section, the results are discussed and conclusions presented in response to the research questions, and limitations and suggestions for future research are given.

2. Literature overview

2.1. Psychosocial Risk Factors in Healthcare

Studies in the field of healthcare have found that one of the reasons why employees quit their jobs is the psychosocial work environment, leading to identity crisis and difficulties in pursuing a career; role conflicts have also been found to occur. In addition, employees are exposed to such psychosocial risk factors as bad work organization, lack of support at work, conflicts between colleagues, and violence and bullying at work (Lachman, 2015; Longo & Hain, 2014). Therefore, the quality of the provided services may be affected because the employees are not committed and dedicated. In addition, as a result of psychosocial risks, several physical and psychological health problems may occur. Both employees and organizations suffer from the negative influences of the psychosocial work environment (Li et al., 2010; Rahman et al., 2017).

The organization of work and creating the psychosocial work environment are important in nursing. When establishing the psychosocial work environment, it is necessary to consider the needs of the employees and the competence of the managers, which is expressed in management awareness and management quality (Mints-Binder, 2014). The psychosocial work environment consists of job demands, employee autonomy to make decisions, the working environment, social support and the effort-reward balance. An imbalance between these factors has a negative influence on the employees and the organization and increases the risk of health problems among the employees (Rahman et al., 2017), including mental health problems (Freimann & Merisalu, 2015) and skeletomuscular diseases (Freimann, Pääsuke & Merisalu, 2016).

A negative work environment causes burnout in the employees, which is in correlation with the quality of patient safety and healthcare services (Ulrich & Kean, 2018). It is essential to note here that the likelihood of errors, such as when administering drugs, increases when the employee is emotionally and physically exhausted. Previous studies have also shown that burnout may cause exhaustion and a lack of commitment to the job (Maslach, Schaufeli & Leiter, 2001; Vifladt et al., 2016). In addition, problems with employee dedication and satisfaction with work have been highlighted in several studies (Freiman & Merisalu, 2015; Ulrich & Kean, 2018). Low perceptions of patient safety caused by worker burnout were also identified in the study by Halbesleben et al. (2008).

Organizational support is an important component of the psychosocial work environment, which is horizontal across relationships with colleagues as well as vertical across relationships with management. Social support in the work environment is expressed in relations with colleagues and the management, in clearly described work roles, work pressure and innovativeness. A lack of social support influences the work satisfaction of the employees and may cause stress at work and burnout (Dehring, Treuer & Redley, 2018).

Social support from the management is mostly perceived in terms of recognition, which according to earlier studies has a positive influence on employee work satisfaction and dedication and is inversely related to quitting one's job (Mints-Binder, 2014; Ulrich & Kear, 2018). Whereas lacking social support from the management may cause employee burnout, depression, stress at work, and a decrease in cognitive abilities may cause somatic problems, which correlates with patient safety and the quality of healthcare services (Dehring et al., 2018; Ulrich & Kear, 2018).

Collaboration, open communication and respect are indicators of the work environment that reflect organizational culture, and which have been referred to by the World Health Organization in recent decades as important indicators for ensuring patient safety (Westerberg & Tufvelin, 2014). Open communication is a component of supporting the work environment, which has a positive influence on employee dedication and behaviour and promotes collaboration between employees (Sepp & Tint, 2017). In addition, collaboration between workers depends on the work environment and its characteristics, which can be learning or punishing. Healthcare organizations by nature should prevent mistakes or be proactive; admitting errors through open communication should enable all employees to avoid repeating mistakes in the future and facilitate learning from mistakes. The abovementioned phenomena are widespread in healthcare organizations in many countries (Goh, Chanand & Kuziemsky, 2013; Ratnapalan & Ulerik, 2014; Sepp & Tint, 2017), where they have created a blame-free culture and non-punitive environment, and where every mistake is identified, registered (Alameddine, Saleh & Natafgi, 2015) and open communication promotes trust, respect and barrier-free collaboration between employees and the management (Harrington & Smith, 2015). Collaboration excludes violence and bullying at work, which is common in the field of healthcare, and also adds psychosocial risk in the work environment, which is related to the mental health of the employees (Granstra, 2015; Lachman, 2015; Longo & Hain, 2014).

Horizontal violence is an increasing issue in the field of healthcare. Several studies show that more than 50% of healthcare workers suffer from the destructive behaviour of their co-workers (Alspach, 2008; Cleary, Hunt & Horsfall, 2010). Violence is also expressed by leaders (vertical violence); Ulrich and Kean (2018) point out that 57% of the participants in their study reported violence-related incidents by their leaders. Violence and/or bullying is caused by the organisation of the work of the institution and its hierarchical culture, where no anti-violence policy exists or practices developed to reduce the incidence of violence (Alspach, 2008; Cleary et al., 2010; Granstra, 2015). It is very difficult for the victim to admit that she/he is a victim and it is easier to keep incidents secret. In order to find out about such incidents, it is necessary to create a safe environment to ensure justice and the protection of the victim (Cleary et al., 2010; Granstra, 2015).

The consequences of bullying are both physical and psychological, and most commonly include: somatic problems, headaches, stress, irritation, anxiety, sleeping problems, worrying, worsening of social skills, depression, fatigue, difficulties in concentrating, hopelessness, psychosocial complaints, and post-traumatic stress (Cleary et al., 2010). All of the previously mentioned phenomena are important regarding patient safety; ignoring them is irresponsible and the consequences can be dangerous. The aim of a healthcare organization is to provide a patient with a quality service, and therefore to minimize the risks. One solution to bullying problems is seen in a strong work environment and supportive organizational culture, where there is open communication and supportive relationships with colleagues and leaders, where employees can talk freely about every possible topic and with everyone, where there are no structural, ethnic or cultural barriers, and where equal treatment of people is ensured (Alspach, 2008; Cleary et al., 2010; Granstra, 2015; Read & Laschinger, 2013; Tuckey et al., 2009; Ulrich & Kean, 2018).

2.2. Patient Safety and the Safety Climate

In healthcare, psychosocial risk factors are related to the quality of the services provided. Studies show that a heavy workload, bad and insecure working conditions, poor work organisation, lack of employee involvement and low safety culture are associated with stress at work and burnout (Garret, 2008; Li et al., 2010; Toode et al., 2015; Vifladt et al., 2016). In a working environment with prevailing psychosocial risk factors, healthcare workers are more commonly diagnosed with anxiety, burnout, depression and the employees have sleeping problems. In the long term, these problems can irreversibly affect the mental health of the nurses, their quality of life and family relations worsen their perception of risk increases and creates stress (Javaid, 2018). The employees suffering from mental health problems are more vulnerable, services provided by them are not safe from both the point of view of the employee and of the patient (Flin, 2007; Garret, 2008). For example, the main sources of hazards for nurses include the risk of injuring themselves with an injection needle (Jahangiri et al., 2016) and burnout (Ogresta, Rusac & Zorec, 2008; Xie, Wang & Chen, 2011).

Burnout syndrome is related to depersonalization, which by nature reflects high emotional fatigue and somatic symptoms and is revealed in the form of cynicism and low dedication (Garret, 2008). According to Garret (2008), stress at work and burnout have a direct relationship to patient safety, and therefore the quality of healthcare services, since according to Wolfe (2001), patient safety is one of the quality indicators of healthcare services. Studies show that stress management at the organisational level can also be the most important aspect in patient safety (Vifladt et al., 2016).

The likelihood of avoiding errors in the work environment is ensured by different strategies, including assessments (Flin, 2007). One method involves assessing the safety climate, which refers to the climate for psychosocial health and worker safety, and can predict worker safety behaviour, accidents and injuries. The safety climate is made up of employee perceptions of the commitment of the management to safety and performance correlated to safety policies, procedures and practices (Dollard & Bakker, 2010). It is important to understand that the organization of work is an integral part of the work environment; bad planning, which is expressed through work pressure and high emotional demands has an influence on the mental health of employees and causes psychological stress at work (Dollard et al., 2007). According to Vifladt et al. (2016), a positive safety culture is associated with a high level of coherence, where workers perceive that they manage stress positively, their work is challenging and meaningful and they have a sense of purpose.

In healthcare, it is important to understand that the organizational climate influences different outcomes, including occupational safety and patient safety, the influence of which is perceivable organizationally and economically. Studies show that in healthcare, occupational safety is related to patient safety (WHO, 2014) and to the safety climate (Flin, 2007; Pousette et al., 2017). It is common for economic pressure to influence the healthcare sector. Rationalizations are expected to be conducted at the same time because, due to the changing demographics, the demands for care are increasing. Since medicine and technology are developing, it is possible to continuously offer high quality care, but the costs are also constantly increasing. A decrease in occupational and patient injuries would reduce unwarranted costs and make resources available for preserving sufficient and satisfactory high-quality care (Pousette et al., 2017).

The main solutions involve senior management dedication and their inclusion in the development of a work environment that includes policies, strategies, practices and procedures for guaranteeing a strong safety culture (Sfantou et al., 2017). We may argue that a positive safety climate may help resolve physical as well as psychological health problems and injuries if it has gained enough attention in the institution. Yet, the money being spent on psychological health problems is substantial (Dollard & Bakker, 2010).

3. Methodology

3.1. Study Design and Sample

The study was designed as a cross-sectional survey to investigate the relationships between work-related psychosocial risk factors and four mental health problems experienced by care workers and nurses in Estonian nursing homes. Cross-sectional studies allow the inclusion of a large number of variables (Thelle & Laake, 2015). This method gives an opportunity to identify different occupational hazards at a specific point in time in the studied sample population and helps to describe the association between the exposure and the outcome. In addition, the method shows the incidence and prevalence of the aspects being assessed (Nour & Plourde, 2019). The survey was conducted in November 2017 in nine nursing homes in four areas of Estonia. The institutions were chosen on a random basis. The sample consisted of nursing homes, aftercare hospitals, private and public (under a local authority) organisations and nursing homes with a special facility for clients suffering from dementia. Previous studies show that work in nursing homes and the healthcare sector is generally emotionally difficult and stressful (Pousette et al., 2017). The main mental health issues emerging from psychosocial hazards include burnout, workplace stress, and depression and somatic symptoms, which may affect the mental health of employees as well as the quality of their work. Due to emotional exhaustion and depersonalization, the employee may experience the need to compromise on patient safety and the quality of their work (McNamara, 2012). Previous studies report that through effective safety management, particularly through establishing a safety culture, the psychosocial climate can be influenced and consequently, mental health problems can be prevented (Pousette et al., 2017). According to a study conducted in Estonia (Freiman & Merisalu, 2015), the prevalent psychosocial hazards among Estonian nurses are quantitative demands (workload), emotional demands, work pace and role conflicts. Based on these results, our study focuses on critical mental health problems such as occupational stress, burnout, depression and somatic symptoms.

Our purpose is to explore the relationships between work-related psychosocial risk factors and the four main mental health problems (i.e. stress, burnout, somatic symptoms and depression) in care workers in Estonian nursing homes.

3.2. Data and Method

In our survey, a paper-based questionnaire was used with a total of 509 participants. The participation was voluntary, in which each questionnaire included a cover letter about the study and definitions of terms. Information about the voluntary nature of the participation was also explained in the letter. A total of 340 completed questionnaires were returned

(66.79% of the sample), the majority of the respondents were female (332 or 97.6%). Approval for the research was obtained from the management of the institutions and The Research Committee of Tallinn Health Care College.

The Copenhagen Psychosocial Questionnaire version II (COPSOQ- II) was used to assess work-related psychosocial factors and mental health problems (MHPs) (Kristensen et al., 2005). A licensed translator performed the translation and returned the translation of the questionnaire. Cronbach's alphas were calculated to assess the internal consistency of the scales for psychosocial factors and MHPs. In our study, psychosocial factors were assessed using 115 items that covered the following four psychosocial domains: a) demands at work; b) work organisation and job content; c) interpersonal relationships and leadership; d) values at the workplace. To assess the MHPs, we used 16 items grouped into the following four scales: stress, somatic stress symptoms, symptoms of depression, and burnout. Most of the scales for the psychosocial factors and MHPs included three or four items, but two scales – predictability and work versatility – included only two items. All items were scored from 0–100 and four response options 0, 33.3, 66.7 and 100, to make the scoring on the different scales comparable (Pejtersen et al., 2010). The total score on a scale was the mean of the scores of the individual items.

3.3. Analysis

Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS Statistics 24.0), using the T-test and Bonferroni correction. Standard deviation and Cronbach's alphas for self-reported psychosocial factors and mental health problems were calculated. Bonferroni correction was used to account for multiple testing problems.

4. Results

Our results show that in Estonian nursing homes, psychosocial hazards were assessed as an actual problem with emphasis on work insecurity, conflict between work and family life, role conflicts, quantitative demands, low influence, low trust level and low social inclusiveness (Table 1). Workers often feel a conflict between work and their private life; work takes so much time that it has a negative effect on family life; workers are worried about becoming unemployed or being transferred to another job against their will. Sometimes they have to do unnecessary things at work, and contradictory demands may pose a role conflict; there is often no time to do the work properly and with a good quality; the workload might be unevenly distributed and at the same time, it is not possible to influence the amount of work assigned to them.

Low mean scores were recorded for the meaning of work, role clarity, social relationships at work, which indicate that those aspects are not considered as psychosocial problems – workers perceive high meaningfulness of their work, the work has clear objectives, and the workers know what they are responsible for and what is expected of them at work. Table 1 presents the mean scores, standard deviations and Cronbach's alphas for self-reported psychosocial factors and mental health problems.

Table 1. Descriptive statistics for work-related psychosocial factors and mental health problems in Estonian nursing homes

Psychosocial factors and MHPs (scale)	Number of items	Mean*	95% Confidence Interval of the Difference		SD	Cronbach's alpha
			Lower	Upper		
Demands at work						
Quantitative demands	3	50.7	47.9	53.4	25.8	0.858
Work pace	3	30.1	28.1	32.2	19.0	0.849
Cognitive demands	4	29.1	27.6	30.5	13.5	0.676
Emotional demands	4	27.1	25.5	28.7	15.0	0.712
Demands for hiding emotions	3	26.4	24.2	28.6	18.3	0.739
Work organisation and job contents						
Influence	4	50.3	47.9	52.7	20.0	0.777
Possibility for development	4	29.6	27.9	31.3	16.0	0.761
Meaning of work	3	17.1	15.6	18.7	14.4	0.836
Commitment to the workplace	3	38.1	36.1	40.1	18.8	0.575
Interpersonal relationships and leadership						
Predictability	2	33.3	31.2	35.4	19.7	0.725
Rewards	5	28.2	26.5	29.9	15.6	0.853
Role clarity	3	19.0	17.4	20.6	15.1	0.848
Role conflicts	4	52.2	49.7	54.6	22.7	0.835
Quality of leadership	4	35.1	33.1	37.1	18.7	0.848
Social support from colleagues	3	25.5	23.7	27.3	16.8	0.763
Social support from supervisor	3	29.7	27.6	31.8	19.6	0.827
Social relationships at work	3	19.0	17.6	20.5	13.6	0.774
Values at the workplace						
Trust	7	47.3	45.6	48.9	15.0	0.622
Justice and respect	4	37.3	35.4	39.3	18.3	0.853
social inclusiveness	3	39.9	37.5	42.3	22.8	0.67
Adequate work organisation						
Insecurity	4	75.4	73.0	77.7	2.,4	0.839
Satisfaction with work	4	24.9	23.4	26.4	14.1	0.823
Work-Family balance	3	62.3	59.4	65.1	26.7	0.839
Conflicts of the family and work	2	80.2	77.9	82.6	22.1	0.828
Mental health problems						
Stress	4	69.1	67.2	71.0	17.8	0.845
Somatic symptoms	4	79.4	77.9	80.9	14.3	0.641
Symptoms of depression	4	77.1	75.5	78.7	15.3	0.736
Burnout	4	63.5	61.2	65.8	21.5	0.904

*Mean - Single item mean of the scale can be calculated by dividing the scale mean with the number of items in the scale. Abbreviation: SD – standard deviation.
Source: composed by the authors

Table 1 presents the descriptive statistics for self-reported psychosocial factors and mental health problems. The mean scores for four mental health problems (stress, burnout, somatic and symptoms of depression) are relatively high – ranging from 63.5 to 79.4. Those scores indicate that workers generally perceive high work-related stress, high burnout levels (workers have felt worn out, physically and emotionally exhausted), physical health symptoms such as headaches, stomach aches and/or tension in various muscles and symptoms of depression such as continuous negative feelings, lack of self-confidence, and lack of interest in everyday things.

The majority of the scales showed satisfactory Cronbach's alphas, which ranged from 0.904 to 0.712 on the scales for psychosocial work characteristics and mental health problems. For care workers, the following scales had Cronbach's alphas coefficients of less than 0.700: commitment to the workplace (0.575), social inclusiveness (0.670), and somatic symptoms (0.641). Cronbach's α is an estimator of internal consistency and provides an assessment of questionnaire consistency, and values may approach one, which means good reliability or towards zero which means poor reliability.

Table 2. Cross-sectional correlation analysis for psychosocial hazards and mental health problems

Psychosocial factors (scales)***	Burnout	Stress	Depressive symptoms	Somatic symptoms
Demands at work				
Quantitative demands	-0.229**	0.055	0.015	-0.01
Work pace	-0.005	0.071	-0.012	0.016
Cognitive demands	0.108*	0.082	0.093	0.083
Emotional demands	0.201**	0.169**	0.174**	0.226**
Demands for hiding emotions	0.190**	0.051	0.118*	0.124*
Work organisation and job contents				
Influence	-0.141**	-0.281**	-0.118*	0.002
Possibility for development	0.124*	0.139*	-0.023	0.033
Meaning of work	-0.043	-0.096	-0.052	-0.004
Commitment to the workplace	-0.287**	-0.165**	-0.161**	-0.098
Interpersonal relationships and leadership				
Predictability	-0.150**	-0.131*	-0.046	-0.024
Rewards	-0.427**	-0.186**	-0.227**	-0.155**
Role clarity	0.102	-0.093	-0.049	0.021
Role conflicts	-0.183**	-0.077	-0.067	-0.016
Quality of leadership	-0.247**	-0.217**	-0.183**	-0.178**
Social support colleagues	-0.08	-0.105	-0.168**	-0.035
Social support management	-0.183**	-0.174**	-0.114*	-0.098
Social relationships at work	0.130*	-0.055	-0.136*	0.026
Values at the workplace				
Justice and respect	-0.095	-0.099	-0.036	-0.039
Social inclusiveness	-0.178**	-0.072	0.005	-0.168**

*Statistically significant p-values ($p < 0.05$),
**Statistically significant p-values ($p < 0.01$),
*** Numerical values based on Pearson's r correlations adjusted using sequential Bonferroni correction
Source: composed by the authors

Our study results show that only three of the psychosocial factors (rewards, emotional demands and quality of leadership) affect the mental health of care workers (Table 2). The items Rewards and Quality of leadership show a negative correlation with all of the mental health problems. The factor of emotional demands shows a positive correlation with burnout, stress, somatic symptoms and symptoms of depression. Our results also indicate that the good organization of work and meaningful job content contribute significantly to the positive mental health of care workers.

Based on the current study, we can conclude that care workers committed to the workplace have negative correlations with stress and burnout. Our results also show that interpersonal relationships and leadership are important aspects in psychosocial risk management in healthcare: workers expect quality management and social support from their supervisors. Our findings show that stress and burnout have a negative correlation with social support from supervisors as well as quality of leadership. In addition, social inclusiveness has negative correlations with burnout and somatic symptoms, which are the predictable components of depersonalization and lack of commitment and motivation.

Table 3. Comparison of psychosocial factors and mental health problems between Estonian care workers, Estonian nurses, Danish nurses and US nurses

Psychosocial factors	Estonia Care workers		Estonia Nurses		Denmark Nurses		United States Nurses	
	M	95% CI	M	95% CI	M	95% CI	M	95% CI
Quantitative demands	51	48-53	32	31-34	51	49-53	61	60-63
Role conflicts	52	17-21	36	34-38	41	39-44	56	52-57
Influence	50	48-53	33	31-35	46	44-47	46	44-47
Demands for hiding emotions	26	24-29	73	72-75			70	62-77
Rewards	28	27-30	58	55-60			59	57-60
Quality of leadership	35	33-37	60	57-62			60	57-63
Social support from colleagues	25	24-27	60	58-62			58	56-60
Social inclusiveness	40	37-42	61	60-63			62	59-64
Mental health problems								
Stress	69	67-71	40	39-43			38	35-40
Symptoms of depression	77	75-79	31	29-33			29	25-30
Burnout	63	61-66	45	43-47			43	39-45

Source: Freiman and Merisalu, 2015 edited by the authors

The comparison of our data with those from previous research (Table 3) and the experiences in other countries show that the mean score for mental health in Estonian nursing homes is higher than previous results in Tartu University hospital and in other countries (ranking from 69 to 77 on a 100-point scale) (Freiman & Merisalu, 2015). The care workers highlight that there are high quantitative demands at their workplace. Similar results were obtained among Danish nurses; however, US nurses reported even higher quantitative demands. The previous study among Tartu University nurses in Estonia indicates the lowest values. An interesting finding is the considerably lower scores for the demand to hide emotions, rewards, quality of leadership, social support from colleagues and

social inclusiveness among care workers in Estonian nursing homes compared to the US. Yet, Estonian care workers are influenced by role conflict and an inability to have any influence at their work compared to Estonian nurses. The results indicating the influence Estonian nurses have on their work are similar to US and Danish nurses; however, the results are considerably higher for role conflicts among US nurses and considerably lower for role conflicts among Danish nurses. Compared to the experiences of other countries, Estonian care workers are not socially included, which is an important finding. This may refer to the exclusion of representatives of this profession and may also give a rise to bullying at work.

It can be concluded that care workers in Estonia suffer from somatic symptoms and symptoms of depression, stress and burnout, they cannot influence their work, have high quantitative demands, and are not included in the activities of the organization, which in turn refers to a high amount of psychosocial factors in the work environment, which is one of the indicators of poor safety management in the organization.

5. Discussion and Conclusion

Based on the research gap, the purpose of this study was to explore relationships between work-related psychosocial risk factors and the following four mental health problems among care workers: stress (Li et al., 2010), burnout (Garret, 2008), somatic symptoms and symptoms of depression (Cleary et al., 2010) in Estonian nursing homes. To achieve our goal, three research questions were explored. The answer to research question 1 enables us to identify risk factors in the psychosocial work environment that have a negative influence on the mental health of healthcare workers.

Based on our findings, factors including low quality of leadership, high quantitative demands, employee role conflicts, low dedication among workers, physically and mentally challenging work, and stress at work have been identified as prevailing in Estonian nursing homes. Similar results have previously been found by Li et al. (2010). To answer research question 2, we explored how the mental health of nurses can affect patient safety and the quality of the services provided. It was found that high standards and role conflict in nursing homes is problematic for care workers and influences their mental health. It is common for Estonian care workers to have an excessive workload and for them to complete assignments that do not correspond to their qualifications, such as medical activities (Sepp & Tint, 2017). Studies have demonstrated that the frequency of mistakes is increasing; for example, regarding the administering of medication, if the employee is emotionally or physically exhausted, when they are not satisfied with their job and have a low level of dedication (Freiman & Merisalu, 2015; Ulrich & Kean, 2018).

The results of our research demonstrate that in terms of the prevention of mental health problems among care workers it is necessary to understand the importance of managing stress and preventing burnout syndrome. Our results revealed the highest level of those two psychosocial factors of mental health when compared with a previous study conducted in Estonia (Seppo et al., 2010). The risk factor "work organization and job content" shows that the workers perceive the need to influence their work and to be included in the activities of the work organization, including safety planning. Earlier studies have shown that inclusion in the decision-making process and an opportunity to influence their work increases dedication, motivation and decreases risk behaviour (Li et al., 2010). Worker involvement in

various health and safety activities depends on the organizational management and safety climate in the organization (WHO, 2014). Risk behaviour is common practice in healthcare, and overtime hours caused by a chronic lack of staff are one of the risk factors, which influences the mental and physical health of the workers. Previous studies have demonstrated that if the organization fills vacancies overtime shifts, this will lead to chronic fatigue among the workers, which correlates with the likelihood of making medical errors. Studies show that having 24-hour-shifts without resting is equal to an alcohol concentration in the blood of 0.10 per mille (Garret, 2008). Rodrigues et al. (2017) point out that employees working a shift more than 12 hours have three times greater probability of making mistakes than those working 8.5 hours a day. In addition, for those working more than 40 hours a week, the risk of errors increases by 46%. Further, the same authors emphasize that long working hours with a heavy workload cause physical and psychological fatigue, which has a direct negative influence on the quality of services offered to the patients through weak patient safety.

Research question 3 was about measures to prevent psychosocial risk factors. Based on results from the current study, several safety measures are proposed in order to reduce the influence of the psychosocial risk factors of the working environment on the mental health of care workers. According to the results of our research, the organization of work is an indicator of proactivity in regard to mental health and of the effective management of the organization. In addition, earlier results have shown that the organization of work, support at work, relations with colleagues and violence or bullying at work have a major influence on employees. When planning the organization of work, the needs and peculiarities of the worker should be taken into account. Therefore, an important role is played by the competence and training of the leaders (Mints-Binder, 2014). The leaders are responsible for preserving the mental health of the employees through the work environment and relations at work that are respectful and encourage good relations, providing a balance between effort and reward and recognizing the employees for their efforts (Freimann & Merisalu, 2015; Rahman et al., 2017). The employees expect support from the management; good relations at work are an important indicator from the point of view of reducing mental health risks, and colleagues and leaders both play an important role in this. Social inclusion is also a risk factor influencing the mental health of care workers, which may carry aspects related to violence and bullying at work. According to the structure and specifics of the organization, care workers are one of the lowest levels and may perceive exclusion by other members of the organization. The results of our research show that care workers perceive social exclusion; therefore, the management of the organization should ensure that all the members of the organization feel safe and necessary in the institution. It is important to respect every professional position and each member of the organization must have their line of responsibility, upon which the quality of patient-centred service depends. Earlier studies have shown that a lack of support from the organization may cause burnout and stress at work, and influence job satisfaction and motivation among the employees (Dehring et al., 2018).

It can be concluded that the work environment and its creation have an influence on the mental health of the employee through different situations and circumstances. This research has contributed to the understanding that a serious problem prevailing in nursing homes is the perception among the employees that they cannot influence their work, which is demotivating and evidently also affects their level of dedication. Attention should be paid to the organization of work and establishing relations and communication within the organization. It is important to be aware that errors are a part of healthcare organizations

and it is common for a person to make mistakes in order to address these issues, so as to avoid mistakes in the future instead of blaming an employee. A worker should not develop a feeling of guilt, but rather, through support from the organization and learning, the development of the employees should be ensured and the problems of mental health prevented (Doss-McQuitty, 2016; Mira et al., 2015). Management of the organization, including safety management should be proactive and oriented towards preserving the health of the employees and offering patient-centred services.

The current study has some limitations that need to be addressed. The quantitative data were self-reported, which can be affected by information bias and recall bias, especially in relation to reporting such delicate and sensitive data as health symptoms and psychosocial risks factors (Barling, Loughlin & Kelloway, 2002; Pransky et al., 1999). It should be mentioned that the main limitation of this research is the sample that concentrates solely on the assessment of the perceptions of care workers. In future research, psychosocial risk management should also be investigated. In addition, it is essential to explore how the organizational safety management system addresses psychosocial risk management and is integrated into other organisational processes within the healthcare organisation. A safety management system including the objective measurement of psychosocial risks in healthcare should be investigated in detail. In addition, future research should explore the planning of the proactive aspects and good practices in the management of psychosocial risks in the healthcare sector.

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