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Surviving chaos : predictors of occupational stress and well-being in emergency nurses

Adriaenssens, J.

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Surviving Chaos

Predictors of Occupational Stress and Well-Being
in Emergency Nurses

Proefschrift ter verkrijging van
de graad van Doctor
aan de Universiteit Leiden.

Jozef Maria Leon Adriaenssens

Adriaenssens, Jozef M.L.

Surviving Chaos: Predictors of Occupational Stress and Well-Being in Emergency Nurses

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Surviving Chaos

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Promotor: Prof. Dr. C.M.J.G. Maes

Co-promotor: Dr. V.M.J. De Gucht

Overige Leden: Prof. Dr. F. Kittel, Université Libre de Bruxelles

Prof. Dr. R. Kleber, Universiteit Utrecht

Prof. Dr. N. Ellemers

Dr. P. Van Bogaert, Universiteit Antwerpen

Dr. M. Van der Doef

Table of contents

Table of contents

Preface	1 - 6
1. <i>Introduction</i>	<i>1</i>
2. <i>Aim of this thesis.....</i>	<i>2</i>
3. <i>Outline of this thesis</i>	<i>3</i>
4. <i>References.....</i>	<i>5</i>
Chapter 1 Determinants of burnout in emergency nurses: a systematic review of 25 years of research.	7 - 34
1. <i>Abstract.....</i>	<i>8</i>
2. <i>Introduction</i>	<i>9</i>
3. <i>The review.....</i>	<i>10</i>
4. <i>Results.....</i>	<i>11</i>
5. <i>Discussion</i>	<i>23</i>
6. <i>Implications for nursing</i>	<i>25</i>
7. <i>References</i>	<i>27</i>
Chapter 2 Exploring the burden of emergency care: predictors of stress-health outcomes in emergency nurses.	35 - 54
0. <i>Abstract.....</i>	<i>36</i>
1. <i>Introduction</i>	<i>37</i>
2. <i>The study.....</i>	<i>38</i>
3. <i>Results.....</i>	<i>41</i>
4. <i>Discussion</i>	<i>47</i>
5. <i>Conclusions</i>	<i>49</i>
6. <i>References.....</i>	<i>51</i>
Chapter 3 The impact of traumatic events on emergency room nurses: findings from a questionnaire survey	55 - 80
0. <i>Abstract</i>	<i>56</i>
1. <i>Introduction</i>	<i>57</i>
2. <i>The study.....</i>	<i>59</i>
3. <i>Results.....</i>	<i>63</i>
4. <i>Discussion</i>	<i>70</i>
5. <i>Conclusions</i>	<i>73</i>
6. <i>References.....</i>	<i>75</i>

Chapter 4	Causes and consequences of occupational stress in emergency nurses, a longitudinal study	81 - 103
	0. <i>Abstract</i>	82
	1. <i>Introduction</i>	83
	2. <i>The study</i>	84
	3. <i>Results</i>	89
	4. <i>Discussion</i>	94
	5. <i>Implications for nursing management</i>	98
	6. <i>References</i>	99
Chapter 5	Goal orientation predicts work engagement and burnout in emergency nurses.....	104 - 121
	0. <i>Abstract</i>	105
	1. <i>Introduction</i>	106
	2. <i>The study</i>	108
	3. <i>Results</i>	111
	4. <i>Discussion</i>	115
	5. <i>References</i>	118
Chapter 6	General discussion.....	122 - 132
	1. <i>Introduction</i>	123
	2. <i>Summary of the main results</i>	123
	3. <i>Bringing it all together: consistencies and inconsistencies</i>	125
	4. <i>Theoretical considerations</i>	128
	5. <i>Strengths and limitations</i>	129
	6. <i>Practical considerations</i>	129
	7. <i>Future directions</i>	130
	8. <i>References</i>	132
	Samenvatting (Dutch summary).....	133 - 137
	Acknowledgements	138
	Curriculum vitae.....	139

Preface

1. INTRODUCTION

Occupational well-being is a multi-dimensional phenomenon that can be defined as the “positive evaluation of various aspects of one’s job, including affective, motivational, behavioral, cognitive and psychosomatic dimensions” (Van Horn, Taris, Schaufeli, & Schreurs, 2004, p. 366-377). These aspects can be classified in two groups: job demands (in terms of physical, psychological, social or organizational aspects of the job that require sustained effort from the employee) and job resources (in terms of physical, psychological, social or organizational aspects that help in the achievement of work related goals, reduction of job demands and alleviation of its consequences, and stimulation of personal growth, learning and development) (Bakker & Demerouti, 2007). Sufficient availability of resources is found to be related to increased motivation and work engagement, while an imbalance between demands and resources can result in psychological strain and occupational stress leading to burnout (Schaufeli, Bakker & Van Rhenen, 2009).

Occupational stress, burnout and work engagement are research topics that have been investigated in numerous studies over the last 40 years (Murphy, 2002 *in* Perrewe & Ganster, 2002; Simpson, 2009). The interactions between the employees, the nature and pace of their job, and the characteristics of the organization in which they work have been studied extensively. Research shows that a good employee-work environment fit is important to promote long term occupational well-being and employee retention (Edwards & Shipp, 2007 *in* Ostroff & Judge (*ed.*) 2007, p 209-258). Over the last decades, occupational stress models has been modified and refined frequently, due to new research findings and the definition of new concepts and models.

Certain professional groups, such as police officers, telephone operators, teachers and health care professionals, were found to be more vulnerable to occupational stress and burnout than others (Johnson et al, 2005). Research indicates that nurses, as a subgroup of health care professionals, are experiencing high levels of occupational stress (McVicar, 2003; Gelsema, Maes & Akerboom, 2007).

The consequences of prolonged or repetitive exposure to occupational stressors or the lack of buffering factors to mitigate the negative effects of this exposure were found to have important (long term) effects. Occupational stress affects in the first place the nurses’ well-being, leading to the development of anxiety, depression, somatic complaints, job dissatisfaction, burnout, illness, prolonged sickness absence and finally turnover. The organization where the nurse works in is also affected, due to loss of human capital, higher absenteeism costs and a decrease in quality of care. The patient, as a health care customer, also bears the consequences of nurse occupational stress, resulting in lower patient satisfaction, higher risk for adverse events and therapy errors, longer hospital stays and even increased

mortality risk (Aiken et al, 2002). Finally, occupational stress affects the entire society with higher health care expenses and rising shortages of nurses in the work field (Langan-Fox & Cooper, 2011; Mark & Smith, 2011).

In recent years, studies have revealed that specific nursing specialties imply exposure to a particular set of stressors (Browning, Ryan, Thomas, Greenberg, & Rolniak, 2007; Sahraian, Davidi, Bazrafshan, Javadpour, 2013). Indeed, the content of the specific nursing job, the patient population, the nature of collaboration and the organization of the work environment differ between nursing specialties. As a consequence, subgroups of nurses are found to have their typical set of occupational stressors and differences in outcomes of occupational well-being. A clear description of these subgroup stressors and the relationships with work and health is important because it offers opportunities to prevent the negative consequences of exposure, to set up specific interventions to improve work conditions and subsequently to improve occupational well-being and prevent turnover.

Emergency departments are at the front line of hospital services (Wu et al, 2011) in between primary and secondary care. The majority of the patients who attend emergency services have acute health care needs. This results in a hectic and chaotic work environment characterized by high time pressure, an unpredictable influx of patients, a very broad spectrum of diseases and injuries, overcrowding, exposure to aggression and violence (partly to drugs and alcohol abuse) and frequent confrontation with suffering and mutilation (Crabbe et al, 2004; Ross-Adjie et al, 2007). As a consequence, emergency (ER-) nurses have to deliver urgent care in “an inherently challenging but highly demanding environment, often requiring providers to make quick life-and-death decisions based on minimal information” (Institute of medicine, 2007). Because of the specificity of the work conditions in emergency care it can be hypothesized that ER-nurses are exposed to a set of occupational stressors that differs from other nursing subgroups.

2. AIM OF THIS THESIS

The aim of this dissertation is to investigate the magnitude, the predictors and the consequences of occupational stress in ER-nurses. This thesis is based on different occupational stress models. As such it explores the relationships between job characteristics and organizational variables in emergency departments, together with demographic factors, coping strategies and job attitudes in ER-nurses on the one hand and several outcomes of occupational well-being in ER-nurses on the other hand.

3. OUTLINE OF THIS THESIS

Chapter 1 is a systematic review of the research findings from 17 studies published over the last 25 years on burnout and its predictors in ER-nurses.

Chapter 2 presents the results of a cross-sectional study, conducted in a sample of 254 ER-nurses from 15 regional Belgian hospitals. The first objective of this study was to determine whether ER-nurses differ from general hospital nurses in terms of job characteristics and organizational factors. Secondly, this study explored to what extent personal characteristics, job characteristics and organizational factors predict job satisfaction, turnover intention, work engagement, fatigue and psychosomatic distress in ER-nurses.

Chapter 3 presents data from a cross-sectional study, conducted in the same sample of ER-nurses. This study examined (1) the frequency of exposure to and the nature of traumatic events in ER-nurses, (2) the percentage of nurses that report symptoms of PTSD, anxiety, depression, somatic complaints and fatigue at a (sub) clinical level, and (3) to what extent exposure to traumatic events, coping and social support was predictive of post-traumatic distress symptoms, psychological distress, somatic complaints and sleep disturbances.

Chapter 4 presents the results of a longitudinal study over a period of 18 months conducted in a sample of 170 ER-nurses from the same Belgian hospitals. This study investigated to what extent changes over time in job characteristics and organizational variables predict job satisfaction, work engagement, emotional exhaustion, turnover intention and psychosomatic distress in ER-nurses at follow-up.

Chapter 5 presents the results of a cross-sectional study, conducted in ER-nurses who participated in the second data wave (N=170). This study explored to what extent the 4-dimensional model of goal orientation adds additional variance to the explanation of burnout and work engagement in ER-nurses, after controlling for demographic variables and job characteristics.

Chapter 6 is the general discussion of this thesis, aiming to (1) integrate the results of the different studies, (2) reflect on consistencies and inconsistencies, methodological issues, and strengths and weaknesses in and between the different studies, (3) highlight a number of practical considerations resulting from the research findings and (4) give recommendations for future directions regarding research on occupational stress and well-being in ER-nurses.

An overview of the variables that were used in the different studies together with the corresponding chapter of this thesis can be found in table 1.

Table 1: Overview of the predictors and outcomes, assessed in the different studies of the present thesis, together with the corresponding chapter number.

[illegible]

Abbreviations: CS: cross-sectional, LT: longitudinal, FT: full-time, PT: part-time, CEN: certification emergency nurse, freq. expos.: frequency of exposure,

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Chapter 1

Determinants and prevalence of burnout in emergency nurses: a systematic review of 25 years of research.

Jef Adriaenssens, Veronique De Gucht, Stan Maes

Submitted to: International Journal of Nursing Studies (under review)

Abstract:

Background: Burnout is an important problem in health care professionals and is associated with a decrease in occupational well-being and an increase in absenteeism, turnover and illness. Nurses are found to be vulnerable to burnout, but emergency nurses are even more so, since emergency nursing is characterized by unpredictability, overcrowding and continuous confrontation with a broad range of diseases, injuries and traumatic events.

Objectives: This systematic review aims (1) to explore the prevalence of burnout in emergency nurses and (2) to identify specific (individual and work related) determinants of burnout in this population.

Method: A systematic review of empirical quantitative studies on burnout in emergency nurses, published in English between 1989 and 2014.

Data sources: The databases NCBI PubMed, Embase, ISI Web of Knowledge, Informa HealthCare, Picarta, Cinahl and Scielo were searched.

Results: Seventeen studies were included in this review. On average 26% of the emergency nurses suffered from burnout. Individual factors such as demographic variables, personality characteristics and coping strategies were predictive of burnout. Work related factors such as exposure to traumatic events, job characteristics and organizational variables were also found to be determinants of burnout in this population.

Conclusions: Burnout rates in emergency nurses are high. Job demands, job control, social support and exposure to traumatic events are determinants of burnout, as well as several organizational variables. As a consequence specific action targets for hospital management are formulated to prevent turnover and burnout in emergency nurses.

1. INTRODUCTION

Several studies show that a positive experience of the work environment (low strain) is related to work engagement and professional commitment, while a negative perception (high strain) is related to a state of depletion of resources, called 'burnout' (Ahola, Toppinen-Tanner, Huuhtanen, Oskinen, & Äänänen, 2009). In the early 70's of the last century, Freudenberger defined burnout as *'the extinction of motivation or incentive, especially where one's devotion to a cause or relationship fails to produce the desired results'* (Freudenberger, 1974). Shortly after, Christina Maslach defined burnout as a psychological state resulting from prolonged emotional or psychological stress on the job (Maslach & Jackson, 1981; Maslach & Jackson, 1981; Maslach, Schaufeli, & Leiter, 2001). Maslach sees burnout as an internal emotional reaction (illness) caused by external factors, resulting in loss of personal and/or social resources: *'Burnout is the index of the dislocation between what people are and what they have to do. It represents erosion in values, dignity, spirit, and will -- an erosion of the human soul. It's a malady that spreads gradually and continuously over time, putting people into a downward spiral from which it's hard to recover'* (Maslach & Leiter, 1997).

Burnout, as defined by Maslach, has three dimensions. The first dimension of the burnout syndrome is "emotional exhaustion". When the emotional reserves are depleted, employees feel that they are no longer able to provide work of good quality. They have feelings of extreme energy loss and a sense of being completely drained out of emotional and physical strength (Maslach & Jackson, 1981). The second dimension "depersonalization" is defined as the development of negative attitudes, such as cynicism and negativism, both in thinking as well as in behavior, in which coworkers and service recipients are approached with derogatory prejudices and treated accordingly (Maslach & Jackson, 1981). The third aspect is "lack of personal accomplishment". This is defined as lack of feelings regarding both job and personal competence and failure in achieving goals (McDonald-Fletcher, 2008; Maslach & Jackson, 1981). There is a general consensus in the literature that emotional exhaustion is the central or core dimension of burnout (Gaines & Jermier, 1983; Sonnentag, Kuttler, & Fritz, 2010).

The consequences of burnout are multiple. Apart from a decrease in the quality of care (in case of health care jobs), a relationship was found between burnout and the occurrence of musculoskeletal disorders, depression, obesity, insomnia, alcohol intake and drug abuse (Poghosyan, Clarke, Finlayson, & Aiken, 2010; Sorour & El-Maksoud, 2012; Iacovides, Fountoulakis, Moysidou, & Ierodiakonou, 1999; Moustaka & Constantinidis, 2010). Burnout also has a negative impact on the quality of life of the employee, with more intra-relational conflicts and aggression (Wu, Li, Wang, Yang, & Qiu, 2011). Finally, burnout can also lead to a significant economic loss through increased absenteeism, higher turnover rates and a rise in health care costs (Borritz, Rugulies, Christensen, Villadsen, & Kristensen, 2006).

The prevalence of burnout, assessed by use of a self-report instrument in a *general working population* in Western countries, ranges from 13% to 27% (Norlund et al., 2010; Lindblom, Linton, Fedeli, & Bryngelsson, 2006; Kant, Jansen, Van Amelsfoort, Mohren, & Swaen, 2004; Houtman, Schaufeli, & Taris, 2000; Aromaa & Koskinen, 2004). *Nurses* are known to be at higher risk for the development of burnout than other occupations (Maslach, 2003; Gelsema et al., 2006). Research showed that nurses indeed report high levels of work related stress (Hasselhorn, Tackenberg, & Müller, 2003; Smith, Brice, Collings, McNamara, & Matthews, 2000; Clegg, 2001; McVicar, 2003) and that 30% to 50% reach clinical levels of burnout (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002; Poncet et al., 2007; Gelsema et al., 2006). According to several authors, the demands that burden the nurses (in terms of work setting, task description, responsibility, unpredictability and the exposure to potentially traumatic situations) and the resources they can rely on, are strongly related to the content of their job and their nursing specialty (Browning, Ryan, Thomas, Greenberg, & Rolniak, 2007; Ergun, Oran, & Bender, 2005; Eriksen, 2006; Kipping, 2000; Mealer, Shelton, Berg, Rothbaum, & Moss, 2007). *Emergency (ER) nursing* is a specialty that differs from other nursing specialties: work in emergency departments is hectic, unpredictable and constantly changing. ER-nurses are confronted with a very broad range of diseases, injuries and problems. Moreover, due to the hectic work conditions and overcrowding, emergency nurses often have to move from one urgency to another, with often little recovery time (Alexander & Klein, 2001; Gates, Gillespie, & Succop, 2011). As a consequence, rates of burnout are found to be very high in emergency nursing settings (Hooper, Craig, Janvrin, Wetsel, & Reimels, 2010; Potter, 2006).

2. THE REVIEW

Aim

The aim of the present review is (1) to examine the level of burnout in ER-nurses and (2) to identify specific determinants of burnout in these nurses, including various individual and work-related factors.

Search methods

The databases NCBI PubMed, Embase, ISI Web of Knowledge, Informa HealthCare, Picarta, Cinahl and Scielo were searched in June 2014 for original research publications that were written or published in the last 25 years (1989-2014) in English, concerning exposure to occupational stress and its consequences in ER-nurses, in terms of burnout. Furthermore, the references of the retrieved papers were searched for additional links. For this search, combinations of the following keywords were used: *strain, stress*, occupational stress, work stress, work-stress, workplace stress, work environment, ER, E.R., trauma center, triage room, A&E, ambulance, critical care facility, emergency service, first aid, "Emergency Service, Hospital" [Mesh], "Emergency Medical Services" [Mesh], "Emergency Nursing" [Mesh], "Emergency Medicine" [Mesh], nurse*, "Nurses"[Mesh], nursing staff, health professional, paramedic, medical staff, critical incident, critical event, traumatic event, predictor, determinant*. The primary outcome key words were *burnout, exhaustion, fatigue, "Burnout, Professional" [Mesh] and M.B.I.* but

also the secondary outcomes *job satisfaction, turnover, mental health, occupational health, anxiety, depression, somatic, post-traumatic stress, secondary traumatic stress, "Stress Disorders, Post-Traumatic" [Mesh], PTSD and P.T.S.D* were taken into account.

Studies were included only if the following criteria were met: the respondents under study ($N \geq 40$) were nurses, and a well-defined part of the respondents worked in an emergency unit or in ambulance care, (2) the focus of the study had to be on determinants/predictors of burnout, (3) the study had to be empirical and quantitative and (4) the response rate was higher than 25%.

Search outcome

The literature search (figure 1) in the different databases revealed 489 research papers but 142 duplicates were removed from the list. From the remaining 347 articles the titles and abstracts were screened and another 289 papers were excluded because (1) the research was qualitative, (2) the paper did not describe primary research or (3) the paper did not adequately report on the target population, determinants or outcomes. From the remaining 58 articles hard copies were acquired and checked according to the inclusion and exclusion criteria. Four additional articles were found by use of the snowball method. Eleven papers were excluded because there were no separate data for a subgroup of ER-nurses, five were excluded because the response rates were lower than 25% and five were excluded because the number of ER-nurses was lower than 40. From the remaining 41 studies seventeen focused on burnout as an outcome measure. Two of these were related to the same study sample (Escribà-Agüir, Martín-Baena, & Pérez-Hoyos, 2006; Escribà-Agüir & Pérez-Hoyos, 2007) and two studies presented cross-sectional and longitudinal results of the same sample (Van der Ploeg & Kleber, 2001; Van der Ploeg & Kleber, 2003). For the purpose of this systematic review, focusing on determinants of burnout, all 17 remaining studies were included. These can be found in alphabetical order in table 1.

3. RESULTS

Study population and study design

All of the 17 reviewed studies, except one (Van der Ploeg & Kleber, 2003), had a cross-sectional design. Self-report questionnaires were used for every study. The initial sample sizes ranged from 57 to 945 respondents (Median: 228) with response rates varying from 25.8% to 100%. Most of the researchers approached entire emergency care units. Two authors collected their data at conferences (Walsh, Dolan, & Lewis, 1998; Browning et al., 2007). The mean percentage of female respondents in the studies was 61.6 % (SD 29.7). Women worked significantly less in ambulance services than in in-hospital emergency services (Mn: 13.8 % vs. 77.5 % $t=6.21$ $p<.001$). One study did not mention gender nor age of the respondents (Walsh et al, 1998). The majority of the respondents were between 35 and 40 years old (range 18 to 67), with the exception of an Egyptian study that included younger ER-nurses (Sorour & El-Maksoud, 2012). The majority of the respondents were holder of a bachelor degree, and about 7 % had

a Master's degree. The mean seniority of the respondents in the different studies ranged from 6.5 to 13 years. Walsh *et al.* (1998) did not mention seniority.

Figure 1: Flow diagram of strategy used to indentify literature

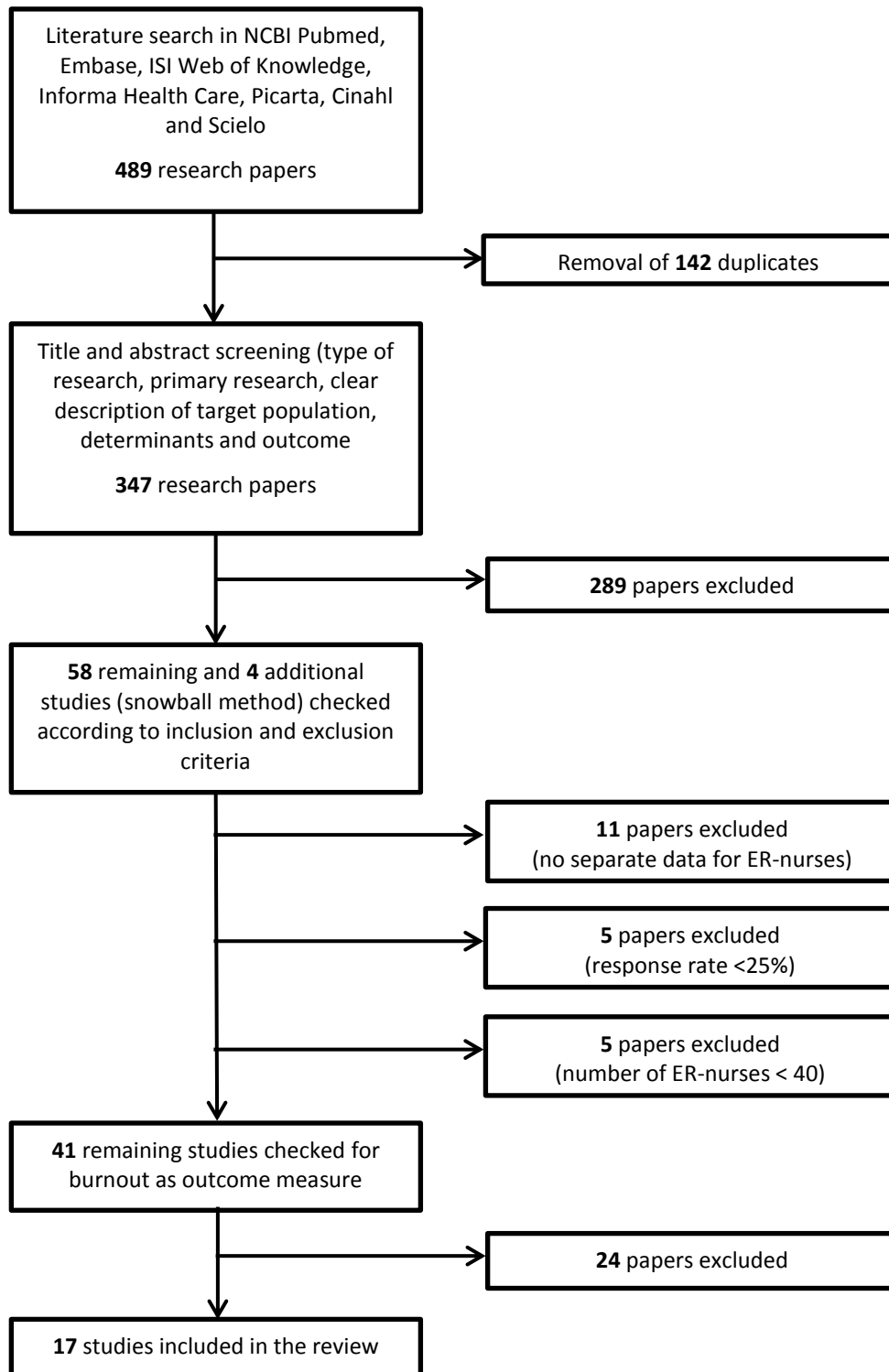


Table 1: Overview of the selected studies, the basic characteristics and results

Author, year of publication and origin of the study	Design*	Approached (Ap) sample and Response rate & participants (Pt)	Measure of Burnout	Translation procedure	Measure of determinants & (instrument used)	EE	DP	PA
Adali & Priami (2002) <i>Greece</i>	CS	Ap: 414 nurses Pt: 233 nurses (56.2%) 99 nurses general ward 83 nurses ICU 51 ER nurses	MBI-HSS	T/BT-AA	Age Psychological demands (WES) Level of innovation (WES) Supervisor support (WES) Task orientation (WES)	R= 3.61 ** SE= 1.26 R= - 2.16 ** SE= 0.81	R = 0.72* SE = 0.34 R = 0.91*** SE = 0.65	R = 0.54 ** SE = 0.19
Alexander & Klein (2001) <i>Scotland</i>	CS	Ap: 160 ambulance workers Pt: 110 ambulance workers (69%) 40 ER nurses 70 EMT	MBI-HSS	OVI	age hardiness (commitment) (HS) hardiness (feelings of control) (HS) hardiness (feelings of challenge) (HS) organizational satisfaction (workplace)	r = 0.12 ^{ns} r = - 0.51*** r = - 0.35*** r = - 0.26 ** r = - 0.29 **	r = - 0.04 ^{ns} r = - 0.45 *** r = - 0.27 ** r = - 0.15 ^{ns} r = - 0.31 ***	r = - 0.29 ** r = 0.45 *** r = 0.37 *** r = 0.20 *
Ariapooran (2014) <i>Iran</i>	CS	Ap: 200 Pt: 173 hospital staff (86.5%) 84 ER-nurses 79 non-ER-nurses	ProQOL R-IV	NIP	Social support (peers & family) (MSPSS)	N.D.	N.D.	N.D.
Bernaldo-De-Quiros (2014) <i>Spain</i>	CS	Ap: 504 ER workers Pt: 441 ER workers (87.5%) 127 nurses 135 doctors 179 ER care assistants	MBI-HSS	TP-PP	Exposure to insults Exposure to threatening behavior Exposure to physical aggression	N.D. N.D. N.D.	N.D. N.D. N.D.	N.D. N.D. N.D.
Browning et al. (2007) <i>United States</i>	CS	Ap: 228 nurses (symposia) 88 ANP's 40 nurse managers 100 ER nurses Pt: 228 nurses (symposia) (100%)	MBI-HSS	OVI	Mastery (McDermott) Perceived control (McDermott)	r = - 0.19 **	r = - 0.17 * r = - 0.12 *	N.D
Escriva-Aguir et al.(2006, 2007) <i>Spain</i>	CS	Ap: 945 staff ER Pt : 639 staff ER Ward (67.7%) 280 nurses 359 doctors	MBI-HSS	TP-PP	High psychological demands (JCQ) Low job control (JCQ) Low social support supervisor (JCQ) Low social support colleagues (JCQ) High static physical demands (JCQ) High dynamic physical demands (JCQ)	OR = 4.98 *** OR = 0.90 ^{ns} OR = 2.89 ** OR = 0.93 ^{ns} OR = 1.80 ^{ns} OR = 1.71 ^{ns}	N.D.	N.D.
Garcia-Izquierdo & Rios-Risquez (2012) <i>Spain</i>	CS	Ap: 262 ER nurses Pt: 191 ER nurses (73%)	MBI-GS	TP-PP	Interpersonal conflicts (NSS) Lack of resources (NSS) Excessive workload (NSS) Lack of social support (NSS) Exposure to traumatic events (NSS)	r = 0.35 * r = 0.17 ** r = 0.39 * r = 0.33 * r = 0.16 **	r = 0.42 * r = 0.18 ** r = 0.34 * r = 0.38 * r = 0.09 ^{ns}	r = - 0.23 * r = - 0.12 ^{ns} r = - 0.10 ^{ns} r = - 0.21 * r = 0.05 ^{ns}
Helps (1997) <i>United Kingdom</i>	CS	Ap: 57 ER nurses Pt: 51 ER nurses (89.5%)	MBI-HSS	OVI	No relevant determinants	N.D.	N.D.	N.D.

Hooper et al. (2010) <i>United States</i>	CS	Ap: 138 nurses (different wards) Pt: 108 nurses (82%) 49 ER nurses 32 ICU nurses 16 Nephrology nurses 12 oncology nurses	ProQOL R-IV	OVI	No relevant determinants	N.D.	N.D.	N.D.
Lahr-Keller (1990) <i>United States</i>	CS	Ap: 532 nurses working in ER Pt: 137 ER nurses (25.8%)	MBI-HSS	OVI	Home/work interference (ENQ) Organizational stress (ENQ)	N.D.	N.D.	N.D.
O'Mahony (2011) <i>Ireland</i>	CS	Ap: 86 ER nurses Pt: 64 ER nurses (74%)	MBI-HSS	OVI	Nurse/physician collaboration (NWI-PES) Feelings of team spirit (NWI-PES) non-punitive management style (NWI-PES) quality of communication with management amount of quality assurance initiatives	$r = -0.21^*$ $r = -0.12^{**}$ $r = -0.21^*$ $r = -0.34^{**}$ $r = -0.26^*$	$r = -0.22^*$ $r = -0.29^{**}$ $r = -0.19^{ns}$ $r = -0.08^{ns}$ $r = -0.11^{ns}$	N.D.
Sorour & El-Maksoud (2012) <i>Egypt</i>	CS	Ap: 58 ER nurses Pt: 58 ER nurses (100%)	MBI-HSS	NIP	No relevant determinants	N.D.	N.D.	N.D.
Stathopoulou et al. (2010) <i>Greece</i>	CS	Ap: 266 ER nurses Pt: 213 ER nurses (81%)	MBI-HSS	TP-PP	No relevant determinants	N.D.	N.D.	N.D.
Van der Ploeg & Kleber (2001) <i>The Netherlands</i>	CS	Ap: 393 ambulance workers Pt: 221 ambulance workers (56.2%) 127 nurses 94 EMT's	MBI-GS	TP-PP	Freq. of exposure traumatic events Avoidant behavior (IES) Psychological demands (QEAU) Lack of good communication (QEAU) Lack of financial reward (QEAU) Lack of adequate information (QEAU) Lack of social support colleagues (QEAU) Lack of social support supervisor (QEAU) Lack of autonomy (QEAU)	$r = 0.26^{***}$ $r = 0.29^{***}$ $r = 0.32^{***}$ $r = 0.16^*$ $r = 0.09^{ns}$ $r = 0.25^{***}$ $r = 0.27^{***}$ $r = 0.35^{***}$ $r = 0.18^{**}$	$r = 0.18^{***}$ $r = 0.26^{***}$ $r = 0.30^{***}$ $r = 0.28^{***}$ $r = 0.04^{ns}$ $r = 0.28^{***}$ $r = 0.32^{***}$ $r = 0.43^{***}$ $r = 0.27^{***}$	$r = -0.40^{***}$ $r = -0.21^{**}$ $r = -0.10^{ns}$ $r = -0.24^{***}$ $r = -0.01^{ns}$ $r = -0.35^{***}$ $r = -0.38^{***}$ $r = -0.38^{***}$ $r = -0.26^{***}$
Van der Ploeg & Kleber (2003) <i>The Netherlands</i>	L	Ap: 393 ambulance workers Pt: T1: 221 ambulance workers (56.2%) 127 nurses 94 EMT's T2: 123 ambulance workers (31%) subdivision not specified	MBI-GS UBOS-A	TP-PP	(predictor at baseline, outcome at follow up) Freq. of exposure traumatic events Psychological demands (QEAU) Lack of good communication (QEAU) Lack of financial reward (QEAU) Lack of social support colleagues (QEAU) Lack of social support supervisor (QEAU) Lack of autonomy (QEAU) Physical demands (QEAU)	$r = 0.30^{**}$ $r = 0.27^{**}$ $r = 0.26^{**}$ $r = 0.09^{ns}$ $r = 0.29^{**}$ $r = 0.41^{***}$ $r = 0.25^{**}$ $r = 0.35^{***}$	$r = 0.20^*$ $r = 0.26^{**}$ $r = 0.12^{ns}$ $r = -0.05^{ns}$ $r = 0.27^{**}$ $r = 0.40^{***}$ $r = 0.18^{ns}$ $r = 0.16^{ns}$	$r = -0.18^{ns}$ $r = -0.14^{ns}$ $r = -0.09^{ns}$ $r = 0.11^{ns}$ $r = -0.42^{***}$ $r = -0.34^{***}$ $r = -0.28^{**}$ $r = -0.10^{ns}$
Walsh et al (1998) <i>United Kingdom</i>	CS	Ap: 200 ER nurses (symposia) Pt: 134 ER nurses (67%)	MBI-HSS	OVI	Annual departmental patient throughput	N.D.	N.D.	N.D.

Abbreviations: ICU: intensive care unit, EMT: emergency medical technician, ANP: advanced nurse practitioner, L: longitudinal, CS: cross-sectional, MBI-HSS: Maslach Burnout Inventory-Human Services Scale, MBI-GS: Maslach Burnout Inventory – General Survey, UBOS-A: Utrecht Burnout Scale – general, ProQOL R-IV: Professional Quality of Life scale, WES: Work Environment Scale, HS: Hardiness Scale, JCQ: Job Content Questionnaire, NSS: Nursing Stress Scale, NWI-PES: Practice Environment Scale of the Nursing Work Index, IES: Impact of Event Scale, ENQ: Emergency Nurse Questionnaire, QEAU: Questionnaire on the Experience and Assessment of Work, MSPSS: multidimensional scale of perceived social support. N.D.: No (adequate) data, R: multiple regression coefficient, OR: Odds Ratio, r: correlation coefficient, T1: baseline, T2: follow-up, OVI: original version of instrument, T/BT-AA: translation/back-translation by author of article, TP-PP: translation procedure described in previous publication, NIP: no information provided.

Global burnout scores of the respondents.

Fifteen out of 17 studies used the Maslach Burnout Inventory to quantify the level of emotional exhaustion, depersonalization and lack of personal accomplishment. Twelve studies used the MBI for human services (MBI-HSS) (Maslach, Jackson, & Leiter, 1996). Van der Ploeg & Kleber (2001) and Garcia-Izquierdo & Ríos-Rísquez (2012) both used the 16-item MBI-GS (Schaufeli, Leiter, Maslach, & Jackson, 1996). The MBI-HSS primarily focuses on professions, in which contact with other people is an essential part of the work content. The items explicitly refer to contacts with clients (Taris, Schreurs & Schaufeli, 1999). The MBI-GS is an MBI-HSS based instrument for the measurement of burnout in non-contactual professions. Several items of the GS-version are identical to the HSS-version, but for other items the source of the surveyed feelings is more related to the content of the work instead of the professional interpersonal contacts (Taris, Schreurs & Schaufeli, 1999). Maslach et al. state that the MBI-HSS and MBI-GS measure the same concept in different occupational groups, based on the same theoretical considerations (Maslach, Jackson, & Leiter in Zalaquett & Wood (eds), 1997). For the purpose of the second measurement of the longitudinal study by Van der Ploeg & Kleber (2003) a 15-item UBOS-A was used (Schaufeli & Van Dierendonck, 2000). Hooper et al (2010) and Ariapooran (2014) used the Professional Quality of Life: Compassion Satisfaction and Fatigue Subscales (ProQOL R-IV) (Stamm, 2010). This is a 30-item instrument using a 6-point likert scale (0=never to 5= very often). The total score of this instrument is used to define burnout, 3 sub-scores are distinguished.

The MBI-HSS cut-off scores for mental health workers (Maslach & Jackson, 1986) and for nurses and physicians (Maslach et al., 1996) can be found in table 2. Cut off points of the MBI (levels designated as limits for the different dimensions of burnout) were set arbitrary at the 33rd and 66th percentile by Maslach et al. (1986). The cut-off scores for the MBI-GS (Brenninkmeijer & Van Yperen, 2003), its Dutch version UBOS-A (Schaufeli & Van Dierendonck, 2000) and the ProQOL R-IV (Stamm, 2010) are also described in table 2. Normative values (Mn and SD) for nurses for the MBI-HSS (sample size 1542 nurses) were published by Schaufeli & Enzman (1998). Normative values for MBI-GS and UBOS-A for human services occupations (sample size 13076 respondents) were published by Schaufeli & Van Dierendonck (2000). Normative data for the ProQOL R-IV were provided in the manual of the instrument (Stamm, 2010).

Table 2: cut-off scores for the MBI-HSS, MBI-GS and UBOS-A for human services occupations

MBI-HSS	Target respondents	Cut off	Normative values
emotional exhaustion	Mental Health personnel ⁽¹⁾ Nurses & physicians ⁽²⁾	≥ 21 ≥ 26	Mn (SD) = 23.80 (11.80)
depersonalization	Mental Health personnel ⁽¹⁾ Nurses & physicians ⁽²⁾	≥ 8 ≥ 9	Mn (SD) = 7.13 (6.25)
personal accomplishment	Mental Health personnel ⁽¹⁾ Nurses & physicians ⁽²⁾	≤ 28 ≤ 33	Mn (SD) = 13.53 (8.15)
MBI-GS / UBOS-A			
emotional exhaustion	Human services personnel ⁽³⁾	≥ 2.38	Mn (SD) = 1.78 (0.99)
depersonalization	Human services personnel ⁽³⁾	≥ 1.60	Mn (SD) = 1.12 (0.77)
personal accomplishment	Human services personnel ⁽³⁾	≤ 3.70	Mn (SD) = 4.21 (0.80)
ProQOL R-IV			
Burnout (general score)	Professional care giver ⁽⁴⁾	≥ 27	Male: Mn (SD) = 48.99 (9.75) Female: Mn (SD) = 50.37 (10.26)

Cut-off scores for MBI-HSS ⁽¹⁾ Maslach & Jackson, 1986; ⁽²⁾ Maslach, Jackson & Leiter, 1996), MBI-GS/UBOS-A ⁽³⁾ Schaufeli & van Dierendonck, 2000) and ProQOL R-IV ⁽⁴⁾ Stamm, 2010)

The means, SD's and percentages of caseness for burnout (whether or not a subject has the condition of interest) for the different studies can be found in table 3. Seven out of 17 studies in this review reported percentages of respondents exceeding the cut off scores for the burnout measures. Five studies, using the MBI-HSS, reported high levels of emotional exhaustion ranging from 9 to 67%, high levels of depersonalization ranging from 13 to 59% and low levels of personal accomplishment ranging from 16 to 42% (Alexander & Klein, 2001; Bernaldo-De-Quiros et al., 2014; Escribà-Agüir et al., 2006; Lahr Keller, 2014; O'Mahony, 2011). The study of Sobhy Sorour & El-Maksoud (2012) reported 37.9% caseness for burnout, but the authors used a scale different from the conventional scale of the MBI-HSS instrument. The study of Van der Ploeg & Kleber (2001), that used the MBI-GS and UBOS-A, reported 11.7%, 17.7% and 16.3% of respondents exceeding the cut off for emotional exhaustion, depersonalization and lack of personal accomplishment respectively. Hooper *et al.* (2010) and Ariapooran (2014) found 22.4% and 19.2% of respondents with high levels of burnout respectively.

Nine out of 17 studies reported means and standard deviations for the different dimensions of burnout (Adali & Priami, 2002; Alexander & Klein, 2001; Helps, 1997; O'Mahony, 2011; Stathopoulou, Karanikola, Panagiotopoulou, & Papathanassoglou, 2011; Walsh et al., 1998; Garcia-Izquierdo & Rios-Risquez, 2012; Van der Ploeg & Kleber, 2001; Van der Ploeg & Kleber, 2003). Browning *et al.* (2007) reported adjusted means (without SD). Regarding the studies that used the MBI-HSS, Alexander & Klein (2001) reported the lowest mean values for emotional exhaustion and depersonalization while O'Mahony (2011) reported the highest emotional exhaustion and Walsh *et al.* (1998) reported the highest depersonalization. For personal accomplishment, the lowest mean value was reported by Stathopoulou *et al.* (2011) and the highest mean was described by Browning *et al.* (2007). Concerning the use of MBI-GS or UBOS-A, Garcia-Izquierdo & Ríos-Rísquez (2012) reported the highest mean for all of the three dimensions of burnout, while Van der Ploeg & Kleber (2001) reported the lowest values for all these dimensions.

Table 3: Means and standard deviations of the dimensions of burnout and the (estimated ⁽¹⁾) percentage of respondents exceeding cut off for these dimensions.

Study & number of respondents	N° of resp.	Scale	EE Mn(SD) EE % > cut off	DP Mn(SD) DP % > cut off	PA Mn(SD) PA % < cut off	Total burnout BO% > cut off
Adali & Priami (2002)	N=233	MBI-HSS	26.53 (11.29) High 45.1% ⁽¹⁾	9.12(5.3) High 49.0% ⁽¹⁾	35.14(10.99) Low 41.2% ⁽¹⁾	
Alexander & Klein (2001)	N=40	MBI-HSS	17.2 (10.7) High 20% ⁽¹⁾	8.4 (6.7) High 26% ⁽¹⁾	34.5 (7.8) Low 36% ⁽¹⁾	
Ariapooran (2014)	N=94	ProQOL R-IV	N.D. N.D.	N.D. N.D.	N.D. N.D.	19.2%
Bernaldo-De-Quiros et al. (2014)	N=127	MBI-HSS	N.D. High 9.5%	N.D. High 13.2%	N.D. Low 16.1%	
Browning et al. (2007)	N=100	MBI-HSS	26.81 N.C	11.98 N.C	37.90 N.C	
Escriba-Aguir et al. (2006,2007)	N=280	MBI-HSS	N.D. High 19%	N.D. High 33.9%	N.D. Low 46.5%	
Helps (1997)	N=51	MBI-HSS	21.34 (9.7) High 29.8% ⁽¹⁾	8.09 (6.19) High 43.9% ⁽¹⁾	36.09 (5.47) Low 28.1% ⁽¹⁾	
Hooper et al. (2010)	N=49	ProQOL R-IV	N.D. N.D.	N.D. N.D.	N.D. N.D.	22.4%
Lahr-Keller (1990)	N=137	MBI-HSS	N.D. High 36%	N.D. High 40%	N.D. Low 42%	
O'Mahony (2011)	N=64	MBI-HSS	30.6 (9.8) High 67% ⁽¹⁾	11.35 (5.9) High 59% ⁽¹⁾	N.D. N.D.	
Statophoulou et al. (2011)	N= 213	MBI-HSS	22.76 (11.12) High 41.8% ⁽¹⁾	9.13 (6.01) High 50.7% ⁽¹⁾	32.68 (8.65) Low 49.3% ⁽¹⁾	
Walsh et al. (1998)	N=134	MBI-HSS	21.78 (10.86) High 32.8% ⁽¹⁾	12.05 (6.76) High 64.9% ⁽¹⁾	35.06 (7.18) Low 35.8% ⁽¹⁾	
Garcia-Izquierdo & Ríos-Rísquez (2012)	N=191	MBI-GS	1.88 (1.44) High 37.2% ⁽¹⁾	1.49 (1.32) High 45.5% ⁽¹⁾	5.13 (1.04) Low 9.4% ⁽¹⁾	
Sobhy Sorour & El-Maksoud (2012) ⁽²⁾	N=58	MBI-HSS	N.D. N.D.	N.D. N.D.	N.D. N.D.	37.9%
Van der Ploeg & Kleber (2001)	N=127	MBI-GS/	1.2 (0.89) High 11.7% ⁽¹⁾	1.1 (0.88) High 17.7% ⁽¹⁾	4.4 (0.87) Low 16.3% ⁽¹⁾	
Van der Ploeg & Kleber (2003)	N=123	UBOS-A	1.3 (1.0) High 15.4% ⁽¹⁾	1.4 (1.1) High 38.2% ⁽¹⁾	4.5 (0.85) Low 20.3% ⁽¹⁾	

Abbreviations: EE = emotional exhaustion, DP = depersonalization, PA = lack of personal accomplishment, BO = burnout, N.C. = not computable, N.D. = No (adequate) data.

⁽¹⁾: data for determination of percentage of respondents exceeding the cut offs were generated with reversed sampling statistics (Minitab® 16.2.4).

⁽²⁾: the scale used for this study is different from the conventional scale of the instrument.

For the purpose of this study and with the aim to estimate the prevalence of burnout among ER-nurses, we used reverse sampling statistics (Minitab® 16.2.4, Pennsylvania) to generate random data for the seven studies that reported only means and standard deviations for the MBI-dimensions. For this reverse sampling method we assumed, based on previous findings, that the reported data of the burnout dimensions had a normal distribution (Schaufeli, Martinez, Marques Pinto, Salanova, & Bakker, 2002; Langelaan, Bakker, Schaufeli, Van Rhenen, & Van Doornen, 2007; Campos & Maroco, 2012). The cut off scores for the respective instruments were used to determine the percentage of respondents with high emotional exhaustion, high depersonalization and low personal accomplishment. The results of these analyses are reported in table 3. A weighted average percentage of caseness for emotional exhaustion, depersonalization and lack of personal accomplishment was calculated. Based upon the scores for the reversely generated samples and the originally reported cut off percentages, on average 25.9% of the respondents exceeded the cut off scores for emotional exhaustion, 34.8% exceeded the cut off for depersonalization and 27.2% exceeded the cut off for lack of personal accomplishment. Considering the general consensus that emotional exhaustion is the core dimension of burnout, this review shows that 26% of the respondents in the selected studies suffered from burnout.

Determinants for burnout in emergency nurses

The studies that were included in this review used a variety of determinants. For the purpose of this review we categorized these determinants in terms of 'individual factors' and 'job related factors', based on an overview of burnout by Maslach *et al.* (2001). For each category, a general introduction is given, followed by the description of the results for the selected studies on burnout in emergency nurses. The results of these studies can be found in table 1.

1. Individual factors

Demographic characteristics

In general populations, younger age was found to be related to a higher risk of burnout. Gender was also found to be predictive of burnout in several studies but the results were not uniform. Some studies found higher levels of burnout in women, others found the opposite and some studies did not find a difference. Higher levels of education were related to higher levels of burnout but the link is still unclear (Maslach et al., 2001).

In the selected studies on ER-nurses, the age of the respondents was found to be related to burnout. Adali & Priami (2002) reported that higher age was related to higher levels of personal accomplishment ($p=.006$). Alexander & Klein (2001) found an inverse relationship: higher seniority was related to lower personal accomplishment. Both studies found no significant relationship between age and emotional exhaustion or depersonalization. Walsh et al (1998), Sobhy Sorour & El-Maksoud (2012) nor Hooper et al (2010) found significant relationships between age, seniority or gender and burnout dimensions.

Personality characteristics

In the job stress literature on a broad set of populations, personality characteristics, such as neuroticism, extraversion, agreeableness, conscientiousness and openness, also called 'The Big Five' personality traits (McCrae & Costa, 1987), were found to be associated with burnout (Zellars, Perrewé, & Hochwarter, 2000; Bakker, Van der Zee, Lewig, & Dollard, 2006; Swider & Zimmerman, 2010; Shimizutani et al., 2008; Maslach et al., 2001). Low levels of hardiness (less involvement in daily activities, a lower sense of control over events, and less openness to change) were also related to higher levels of emotional exhaustion (Maslach et al., 2001).

In the ER-nurses studies, included in the present review, personality characteristics were not frequently reported as potential determinants of burnout. Alexander et al found persons with a hardy personality to view events more as meaningful (leading to higher levels of commitment), challenging and under their control than their colleagues. This study reports a strong negative correlation between the level of commitment, perceived control, job challenge and emotional exhaustion. Also for depersonalization negative relationships were found with commitment and control. Personal accomplishment was positively related to commitment, control and challenge (Alexander & Klein, 2001). Lack of flexibility, stubbornness, judgmental behavior and difficulty in adaptation were also reported as potential determinants of burnout (Walsh et al., 1998).

Coping strategies

In studies on occupational well-being in nurses, coping strategies were found to be related to well-being and performance. Active problem focused coping was found to be related to lower levels of emotional exhaustion and depersonalization and to higher personal accomplishment. Passive avoidant and emotional coping strategies, especially when used alone or as a dominant mode of coping, were found to be ineffective in dealing with stress (Shirey, 2006; Shimizutani et al., 2008; Maslach et al., 2001; Semmer, 2003).

In the selected studies in ER-nurses, Van der Ploeg & Kleber (2001) found significant positive correlations between avoidant behavior and emotional exhaustion and depersonalization and reported a negative correlation with personal accomplishment. They state that avoidant behavior after exposure to traumatic events is not a good long term coping strategy for ER-nurses. Browning et al. (2007) found feelings of mastery to be a mediator between occupational stressors in ER-nurses and depersonalization with higher levels of mastery leading to lower levels of depersonalization.

Job attitudes

Studies in different populations show that the expectations that employees have in respect to their job are related to the level of burnout. Higher expectations and higher goal setting were expected to lead to higher occupational efforts and thus to higher levels of emotional exhaustion and depersonalization. The empirical results over the last decades were however not uniform (Maslach et al., 2001).

In none of the studies in ER-nurses, included in this review, job attitudes and goal setting were investigated as a predictor of burnout in ER-nurses.

2. Work related factors

Exposure to traumatic events

Repetitive professional exposure to traumatic events, such as confrontation with severe injuries, death, suicide, aggression and suffering, was reported to be related to the development of Post-Traumatic Stress Syndrome (PTSD) and burnout in various nurses' populations (Donnelly & Siebert, 2009; Mealer, Burnham, Goode, Rothbaum, & Moss, 2009; Collins & Long, 2003).

In one of the studies included in the present review, Alexander & Klein (2001) reported that ER-nurses who were exposed to traumatic events in the previous 6 months had higher levels of caseness for high emotional exhaustion (23% vs. 5%, $p = .03$) and high depersonalization (32% vs. 0%, $p=.003$) but they found no differences for caseness of low personal accomplishment (33% vs. 35%, $p= .89$), compared to non-exposed ER-nurses. They reported that 69% of the exposed ER-nurses mentioned that they 'never' had sufficient time to recover emotionally between traumatic events (Alexander & Klein, 2001). Van der Ploeg & Kleber (2001) found the number of traumatic events to be positively correlated to posttraumatic stress symptoms, emotional exhaustion and depersonalization. In their longitudinal study (2003) they found a positive long term relationship between frequency of exposure at baseline and emotional exhaustion and depersonalization at follow up. Garcia-Izquierdo & Ríos-Rísquez (2012) reported a positive correlation between frequency of confrontation with death and suffering and emotional exhaustion. Bernaldo-De-Quiros et al. (2014) found nurses who were exposed more frequently to violence (insults, threats and physical violence) to report higher levels of emotional exhaustion and depersonalization.

Job characteristics

One of the most popular theoretical occupational stress models is the Job Demand Control Support Model (JDCS), developed by Karasek & Theorell (1990). This model defines three dimensions as predictors of occupational stress: 'job demand' as a burden and 'job control' and 'social support' as potential resources or buffers. Job demand is defined as the psychological work load in terms of time pressure, role conflict and quantitative workload. Job control, also called decision latitude, is the amount of freedom that a worker has, to control and plan his/her work activities. This dimension has in turn two sub-dimensions that are however interrelated: skill discretion and decision authority. Skill discretion is the range of skills and competences that a worker needs to fulfill his working tasks and is also related to the (future) opportunities of the worker to acquire new skills, expand his/her knowledge in the job or get promotion. Decision authority, or autonomy, is the amount of freedom that a worker has, to choose and to plan his tasks and is closely related to participation and involvement. The third dimension of the JDCS-model,

social support, is defined as the amount of psychological and instrumental help and support that a worker can count on at work. It also has two sub-dimensions: social support provided by the colleagues or co-workers and social support provided by the supervisor. Previous research in multiple occupational groups showed relationships between JDCS-variables and burnout (Mark & Smith, 2008). Research in nurses also revealed relationships between JDCS-variables and burnout (Häusser, Mojzisch, Niesel, & Schulz-Hardt, 2010; Gelsema et al., 2006). In those studies, burnout was seen as an end-stage of adaptation failure resulting from the long-term imbalance between job demands and resources (McSherry, Pearce, Grimwood, & McSherry, 2012).

A number of studies, included in this review on ER-nurses report JDCS-variables to be related to burnout. The results are described by JDCS-variable.

Psychological demands (work/time pressure) was found to be related to burnout and its dimensions. Adali & Priami (2002) found work pressure to be a significant positive predictor for emotional exhaustion. Escriba-Aguir & Pérez-Hoyos (2007) found high psychological demands to be predictive of high levels of emotional exhaustion. Garcia-Izquierdo & Ríos-Rísquez (2012) found excessive workload to be related to higher emotional exhaustion and depersonalization but found no relationship with personal accomplishment. Van der Ploeg & Kleber (2001) report positive correlations between emotional demands and emotional exhaustion and depersonalization but did not find any relationship with personal accomplishment. In their longitudinal study emotional demands at baseline were positively related to emotional exhaustion and depersonalization at follow-up (Van der Ploeg & Kleber, 2003). One study reported an inverse relationship: an increase in the job demand score was related to a decrease in the general burnout score ($r = 0.34, p < .01$) (Sorour & El-Maksoud, 2012). *Physical demands* in ER-nurses showed no relationship (dynamic nor static) with burnout in the study of Escriba-Aguir & Pérez-Hoyos (2007). However, this variable was found to be predictive for higher emotional exhaustion in longitudinal analysis (Van der Ploeg & Kleber, 2003).

The level of *Job Control* was negatively related to emotional exhaustion and depersonalization and positively related to personal accomplishment (Alexander & Klein, 2001). In the study of Browning *et al.* (2007), perceived control moderated the relationship between work stressors on the one hand and emotional exhaustion and depersonalization on the other hand. Escriba-Aguir & Pérez-Hoyos (2007) did not find a relationship between control and emotional exhaustion. Van der Ploeg & Kleber (2001) found lack of autonomy, as a sub-dimension of control, to be positively related to emotional exhaustion, depersonalization and negatively to personal accomplishment. In their longitudinal study (2003) lack of autonomy at baseline was related to higher emotional exhaustion and lower personal accomplishment at follow up, but no significant relationship with depersonalization was found.

In the study of Garcia-Izquierdo & Ríos-Rísquez (2012) lack of *social support* in general was found to be predictive for higher depersonalization and lower personal accomplishment. Escriba-Aguir & Pérez-Hoyos (2007) found low supervisor social support to be related to higher emotional exhaustion while no relationship was found between co-worker social support and emotional exhaustion. Van der Ploeg & Kleber (2001) found lack of supervisor social support to be positively related to emotional exhaustion, depersonalization and negatively to personal accomplishment. Lack of social support from colleagues was also positively related to emotional exhaustion, depersonalization and negatively to personal accomplishment. In contrast, Adali & Priami (2002) found a rise in supervisor social support to be related to an increase in depersonalization. In their longitudinal study, Van der Ploeg & Kleber (2003) found lack of supervisor social support at baseline to be related to higher emotional exhaustion and depersonalization and to lower personal accomplishment at follow up. Also lack of social support from colleagues at baseline showed significant correlations with higher emotional exhaustion and depersonalization and lower personal accomplishment at follow up. Interpersonally conflicts, that can be very disturbing for the team cohesion, were found to be positively related to emotional exhaustion, depersonalization and negatively to personal accomplishment in ER-nurses (Garcia-Izquierdo & Rios-Risquez, 2012). Ariapooran (2014) found higher levels of social support from peers and family to be related to lower levels of burnout.

Organizational factors

Next to job characteristics, organizational and environmental characteristics, such as personnel and material resources, procedures, policies, organizational culture and reward, proved to be associated with the employees' wellness in several study populations (Maslach et al., 2001; Poncet et al., 2007).

In one of the studies included in the present review (O'Mahony, 2011) 53% of the ER-nurses rated their work environment as unfavorable. In another study (Alexander & Klein, 2001) dissatisfaction was associated with higher scores on emotional exhaustion and depersonalization. The existing literature on ER-nurses mentions various organizational factors as determinants for burnout. These are described below.

Communication and collaboration with other professional disciplines was taken into account in a number of studies. O'Mahony (2011) reported nurse/physician collaboration to have a negative correlation with emotional exhaustion and depersonalization. The experience of working as a team was also negatively related to depersonalization (O'Mahony, 2011). Another study found the level of interpersonal conflicts to be positively related to emotional exhaustion and depersonalization and negatively related to personal accomplishment (Garcia-Izquierdo & Rios-Risquez, 2012). The quality of work place communication and information provision was found to be negatively related to burnout: O'Mahony (2011) reported quality of communication between hospital management and hospital employees, as a function of listening and responding, to be predictive of lower levels of emotional exhaustion. Van der

Ploeg & Kleber (2001) report a relationship between poor communication and higher emotional exhaustion and depersonalization and lower personal accomplishment. In their follow up study they found a relationship between poor communication at baseline and higher levels of emotional exhaustion at follow-up (Van der Ploeg & Kleber, 2003).

Staffing issues were taken into account in two studies: quality of staffing, adequacy of work schedules and shift work were significantly correlated with fatigue and decreased concentration, what in turn was related to burnout (Walsh et al., 1998). Understaffing was mentioned as an important predictor of stress and burnout in ER-nurses (Helps, 1997). Permanent night shift was related to a decrease in feelings of personal accomplishment ($F(3,185)=3.06$ $p<.05$) (Garcia-Izquierdo & Rios-Risquez, 2012). *Lack of material resources* was found to be related to higher emotional exhaustion and depersonalization (Garcia-Izquierdo & Rios-Risquez, 2012). *Organizational culture* was also taken into account. A more innovative culture on the ward was found to be related to lower levels of emotional exhaustion (Adali & Priami, 2002). O'Mahony (2011) reported that a perceived lack of quality assurance initiatives in the institution was associated with higher levels emotional exhaustion. *Financial reward* was not found to be predictive of any dimension of burnout in ER-nurses (Van der Ploeg & Kleber, 2003).

4. DISCUSSION

In the present study the research on burnout, conducted in the past 25 years in ER-nurses, was examined. This review focuses on (1) the prevalence of burnout in nurses working in ER-settings and (2) the identification of the determinants of burnout in terms of individual factors (demographic characteristics, personality factors, coping strategies and job attitudes) and work related factors (exposure to traumatic incidents, job characteristics and organizational factors). We analyzed the results of 17 empirical studies published between 1989 and 2014. All of these quantitative studies had a study sample of at least 40 ER-nurses, with a response rate higher than 25% and burnout as an outcome measure.

The weighted average percentage of respondents exceeding the cut-off for the different dimensions of burnout was 26% for emotional exhaustion, 35% for depersonalization and 27% for lack of personal accomplishment. These results are alarming and need attention of all stakeholders. The broad range of caseness between the selected studies can be partly explained by the small sample sizes in several studies. However, previous research in other nursing populations also showed significant cross-national differences in the scores on the MBI-dimensions. North-American nurses were found to have higher levels of emotional exhaustion and depersonalization than their Dutch colleagues (Schaufeli & Van Dierendonck, 1995). Significant differences in emotional exhaustion and depersonalization were also found between Irish, Greek, Italian, Polish, Dutch and British nurses (O'Mahony, 2011; Pisanti, Van der Doef, Maes, Lazzari, & Bertini, 2011; Schaufeli & Janczur, 1994). Several explanations can be given for

this finding. First of all, there are important differences in the professional status and the role of nurses in the health care system across the world (McGonagle et al., 2013; Pisanti et al., 2011). This implies differences in work pace, amount of professional autonomy, span of control and interdisciplinary collaboration and communication. Besides, responses on well-being measures were found to be different between cultures and nationalities. Schaufeli & Van Dierendonck (1995) advised therefore to be cautious with cross-national comparison of burnout results. Poghosyan *et al.* (2009) also showed significant differences in the factor loadings and inter-correlations of the MBI-items across countries. Transnational differences in the perception and scoring of the MBI-items might have resulted in differences in the composite scores on the burnout dimensions (Poghosyan, Aiken, & Sloane, 2009). All these issues point at important methodological flaws in cross-cultural research. As pointed out by Squires et al. (2013) even translation/back-translation of an instrument such as e.g. the MBI, is not a sufficient guarantee for the comparability of the results. Characteristics of the health care system, mastery of professional language, relevance to health care workers in different countries, and quality of professional research infrastructure are other sources of instrumental bias. Another aspect that may hamper the comparison of the burnout scores for the selected studies in this review is the fact that three different instruments were used (MBI-HSS, MBI-GS and ProQOL R-IV).

The sample size and the response rate of certain studies included in this review is low, which may have influenced the results of the study. Differences in composition of the study samples may also have influenced the results. It is remarkable that the two highest and the two lowest rates of caseness for emotional exhaustion and depersonalization are respectively reported by the study samples with the highest and the lowest proportions of female nurses. Two authors collected their data at conferences because of the availability of potential respondents (Walsh et al., 1998; Browning et al., 2007). This can have caused bias (healthy worker effect) since people who go to congresses are less likely to suffer from burnout. Finally, the study of Sobhy Sorour & El-Maksoud (2012) used a different scale than the conventional MBI-HSS instrument, making comparison of the prevalence results with other studies impossible. Nevertheless, the average caseness for burnout in ER-nurses is high and requires the attention of hospital management and policy makers, as burnout is directly related to job satisfaction (Rheajane, Labrague, & Rosales, 2013), nurses' well-being (Burke, Koyuncu, & Fiksenbaum, 2010), nurse turnover (Leiter & Maslach, 2009), patient safety (Halbesleben, Wakefield, Wakefield, & Cooper, 2008) and quality of care (Poghosyan, Clarke, Finlayson, & Aiken, 2010). High rates of caseness for burnout were also found in studies in non-ER nursing disciplines: 42% in a general nurses population (Ball, Pike, Griffiths, Rafferty, & Murrells, 2012), 33 % in critical care (ICU) nurses (Poncet et al., 2007), 31% in chronic hemodialysis nurses (Flynn, Thomas-Hawkins, & Clarke, 2009), 40% in hospital nurses (Vahey, Aiken, Sloane, Clarke, & Delfino, 2004), 59% in mental health nurses (Goalder & Schultz, 2008) and 51% in primary care nurses (Imai, Nakao, Tsuchiya, Kuroda, & Katoh, 2004).

Several studies emphasize the need of a good person-environment fit in the prevention of burnout (Maslach & Leiter, 2008; Leiter, Gascón, & Martinez-Jarreta, 2010; Bakker, Demerouti, & Euwema, 2005; Mark & Smith, 2008). This implies that a complex set of work related and person related variables has to be taken into account. However, the majority of the 17 studies on occupational stress and burnout in ER-nurses in the present review lack a theoretical background. Most studies only measure some work stressors and some outcomes, without taking into account the perception of the stressor by the ER-nurse. Additionally, often different measures were used to assess a common concept. The lack of similarity across the different studies in terms of determinants, instruments and outcomes is an obstacle to conduct a meta-regression analysis, what makes a proper statistical summary impossible. Moreover, 16 out of 17 studies had a cross-sectional design. All these issues are quite unfortunate because (1) only small parts of variance can be explained, (2) interrelationships between determinants cannot be adequately investigated, (3) results from different studies on the same concept cannot be compared and (4) causal relationships between determinants and outcomes cannot be drawn. A more preferable approach is the use of a longitudinal design based on an information processing approach which takes into account the consequences over time of individual appraisal and coping of work stress (Perrewé & Zellars, 1999; Mackintosh, 2007).

Starting from the abovementioned methodological strengths and weaknesses, the results of Van der Ploeg & Kleber (2001, 2006), Escriba-Aguir & Pérez-Hoyos (2007) and Garcia-Izquierdo & Ríos-Rísquez (2012) provide the strongest evidence concerning burnout and its determinants in ER-nurses. These studies show that the JDCS-variables are strong determinants of burnout in ER-nurses. Van der Ploeg & Kleber (2001, 2006) and Garcia-Izquierdo & Ríos-Rísquez (2012) also showed the deleterious (long term) effect of repetitive exposure to traumatic events on the development of burnout in ER-nurses. Finally, seven out of 15 studies indicate the importance of good communication, interdisciplinary collaboration and team spirit to prevent burnout (Adali & Priami, 2002; Escriba-Agüir & Pérez-Hoyos, 2007; Escriba-Agüir & Pérez-Hoyos, 2007; Escriba-Agüir et al., 2006; Garcia-Izquierdo & Ríos-Rísquez, 2012; O'Mahony, 2011; Van der Ploeg & Kleber, 2001; Van der Ploeg & Kleber, 2003). On the other hand, personality characteristics, coping strategies and job attitudes (goal orientation) were underinvestigated in the selected studies. Future research should take these aspects into account.

5. IMPLICATIONS FOR NURSING

Although several studies suffer from methodological weaknesses and flaws, the present systematic review offers ideas for burnout prevention and nurse retention policy in ER-nurses. Interventions could focus on (1) the promotion of adequate professional autonomy (in terms of clinical decision making, interdisciplinary consultation and collaboration), (2) the creation of a good team spirit and sufficient peer support in ER-departments, (3) qualitative leadership of nursing supervisors (in terms of social support,

coaching, transparent communication and provision of opportunities for innovation and quality assurance), (4) reduction of repetitive exposure to traumatic events, (5) creating time-out facilities for (exposed) ER-nurses, (6) provision of counseling for exposed nurses and (7) training of ER-nurses in anticipatory coping skills. As there is currently, to our knowledge, no evaluation study of such interventions in ER-nurses, future intervention research should examine the validity of these suggestions.

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Chapter 2

Exploring the burden of emergency care: predictors of stress-health outcomes in emergency nurses.

Jef Adriaenssens, Veronique De Gucht, Margot Van der Doef, Stan Maes

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Abstract

Aims. This paper is a report of a study that examines (1) whether emergency nurses differ from a general hospital nursing comparison group in terms of job and organizational characteristics and (2) to what extent these characteristics predict job satisfaction, turnover intention, work engagement, fatigue and psychosomatic distress in emergency nurses.

Background. The work environment and job characteristics of nurses are important predictors of stress-health outcomes. Emergency nurses are particularly exposed to stressful events and unpredictable work conditions.

Methods. This cross-sectional study (N=254) was carried out in 15 emergency departments of Belgian general hospitals in 2007-2008, by means of the Leiden Quality of Work Questionnaire for Nurses, the Checklist Individual Strength, the Utrecht Work Engagement Scale and the Brief Symptom Inventory.

Results. Emergency nurses report more time pressure and physical demands, lower decision authority, less adequate work procedures and less reward than a general hospital nursing population. They report however more opportunity for skill discretion and better social support by colleagues. Work-time demands appear to be important determinants of psychosomatic complaints and fatigue in emergency-nurses. Apart from personal characteristics, decision authority, skill discretion, adequate work procedures, perceived reward, and social support by supervisors prove to be strong determinants of job satisfaction, work engagement and lower turnover intention in emergency nurses.

Conclusion. Emergency departments should be screened regularly on job and organizational characteristics to identify determinants of stress-health outcomes that can be the target of preventive interventions.

1. INTRODUCTION

Occupational stress can be defined as the potentially harmful physical and emotional responses that occur when job requirements do not match the capabilities, resources, or needs of the worker (NIOSH, 2009) (Sauter et al., 2009). While stressful events or stressors at the worksite can thus elicit stress reactions, stress is currently seen as the result of an interaction between characteristics and behavior of the employee and his or her (occupational) environment (Hart & Cooper, 2001). Occupational stress can ultimately lead to a variety of health-related problems that may also have important consequences for the organization. Stress-related physical illnesses, including coronary heart disease, migraine, hypertension, irritable bowel syndrome, musculoskeletal problems and also psychological problems, such as anxiety, depression, insomnia and feelings of inadequacy, are associated with absenteeism, decreased work performance, work-home conflicts, burnout and turnover intention (Cooper et al., 2001; McVicar, 2003).

Nurses are particularly vulnerable to many of these consequences, since they are continuously exposed to important work related stressors (McGrath et al., 2003). Health care professionals are confronted with high work load and have important responsibilities, including potentially disastrous effects of errors (McVicar, 2003). They are also frequently exposed to stressful situations, e.g. through contact with human pain, suffering, and death, and to physical danger of infectious disease and injury (Wheeler, 1998). It is thus not surprising that large international studies have shown that nurses are particularly vulnerable to occupational stress (Hasselborn et al., 2003; McVicar, 2003).

Specific nursing specialties imply however exposure to specific stressors (Browning et al., 2007), which is also the case for emergency care nursing. Due to the variation in pathology in emergency room (ER) departments, nurses are exposed to a broad variety of stressors, and to constantly changing, hectic and hardly predictable work conditions (Kilcoyne & Dowling, 2007). In addition, emergency nursing requires instantaneous decisions about life and death, and implies very frequent exposure to traumatizing incidents with injured persons (including children), mutilation, aggression and extreme suffering. For example, Gerberich et al (2004) reported higher rates of violence in emergency care settings than in general wards. As a consequence of confrontation with stressful situations, emotional distress and burnout are very common in emergency care workers (Potter, 2006). Adali (2002) found higher levels of emotional exhaustion in ER-nurses than in intensive care units or general wards. Browning et al (2007) found higher levels of burnout in ER-nurses than in nurse practitioners or nurse managers. Yang et al (2001) even found decreased immunologic responses in stressed ER-nurses, related to burnout, in comparison with general ward-nurses.

Background

The present study is based on the Job Demand Control Support (JDCS) model (Karasek & Theorell, 1990). In the extended model, psychological strain (fatigue, anxiety, depression) and ill health are seen as possible consequences of high job demands, low job control (his or her decision authority and skill discretion) and low social support at work from supervisor and/or colleagues (Van der Doef & Maes, 1998; Van der Doef & Maes, 1999b). Although the JDCS-model explains an important part of the variance in stress-health outcomes, the model does not take into account the environmental or organizational context in which work tasks take place (Akerboom & Maes, 2006). For that reason, the predictors in this study include the JDCS constructs (Karasek & Theorell, 1990) but also organizational characteristics that are derived from the Tripod accident causation model. The Tripod accident causation model (Wagenaar et al., 1990; Wagenaar et al., 1994) postulates that unsafe acts are not random events, but have their immediate origins in psychological states of mind (e.g., ways of reasoning, expectations, motives, plans, haste, emotional preoccupation). These states of mind, in turn, are elicited by dysfunctional aspects of the organizational environment, the latent failures (e.g., poor planning, a reward system or norm that stresses speed, poor information provision, understaffing, poor training, having to work with poor tools or materials). These latent failures or organizational characteristics also prove to have important adverse consequences in terms of stress health outcomes (Akerboom & Maes, 2006). Until now no research in emergency nurses has been conducted on both job-content related factors and organizational characteristics, as potential predictors of stress-health outcomes.

2. THE STUDY

Aims

This study focuses on two research questions. The first question is whether ER-nurses differ from a general hospital nursing comparison group in terms of job characteristics and organizational factors. The second and main research question of this study is: to what extent do (1) personal characteristics (including gender, age, work regime, shift work, degree and possession of a specialty certificate of emergency nurse), (2) job characteristics (job demand, control and social support), and (3) organizational factors (including rewards, personnel resources, material resources and procedures), predict job satisfaction, turnover intention, work engagement, fatigue and psychosomatic distress in ER-nurses?

Design

This is a cross-sectional study, carried out in the emergency departments of 15 Belgian (Flemish) general hospitals, by means of a self-administered structured survey, from December 2007 until March 2008.

Participants

The study population consisted of all the emergency nurses who had patient contact (N=308) and were working for longer than one month in the emergency care unit of one of the 15 hospitals. Supervisors and nursing managers were excluded from the sample. A general nurses sample (N = 669) from a large hospital was used for comparison purposes (Gelsema et al, 2005). A total of 254 completed questionnaires was returned (response rate 82.5%).

Data collection

Personal characteristics

Data were gathered on the socio-demographic status of each respondent, including age, gender, marital status, resident children, level of education, degree, possession of an emergency nurse certificate, years of service, type of contract, number of working hours, shift work schedule and specific work tasks.

Quality of work: job characteristics and organizational variables

In this study, the Leiden Quality of Work Questionnaire for nurses (LQWQ-N) (Maes et al., 1999; Gelsema et al., 2005) was used. The LQWQ-N consists of 14 subscales measuring job characteristics (work/time demands, physical demands, decision authority, skill discretion, social support from supervisor and colleagues), organizational characteristics (rewards, personnel resources, material resources, work procedures, nurse/doctor collaboration and internal communication), and two outcome variables, namely 'job satisfaction' and 'turnover intention'. This validated questionnaire was derived from the Leiden Quality of Work Questionnaire (LQWQ) (Van der Doef & Maes, 1999a). The items of the LQWQ-N are occupation-specific. In homogeneous samples, occupation-specific instruments are to be preferred over general measures, as they explain more variance in relevant outcome variables (Van der Doef & Maes, 2002). The factor structure of the LQWQ-N was determined by means of factor analyses and reliability analyses. All items are formulated as statements which have to be rated on a 4-point Likert scale, ranging from 'totally disagree' to 'totally agree'. The subscales are described below; for each scale the Cronbach's- α for this sample is given, as well as the number of items and an item-example.

Job Characteristics: Work and Time Demands ($\alpha = .78$; 5 items): work pressure and time pressure ("During my shift, I am responsible for the care of too many patients."). Physical Demands ($\alpha = .78$; 4 items): physical burden of work ("In carrying out my work, I must often lift or move large and/or heavy objects."). Skill Discretion ($\alpha = .86$; 4 items): task variety and the extent to which the job challenges one's skills ("My job gives me the opportunity to develop my abilities."). Decision Authority ($\alpha = .70$; 4 items): extent to which nurses have the freedom to act on what they know and the amount of decision authority they have over their work conditions ("I have the opportunity to make my own decisions at work."). Social Support Supervisor ($\alpha = .93$; 4 items): support provided by the supervisor ("I feel appreciated by my supervisor."). Social Support Colleagues ($\alpha = .85$; 4 items): instrumental and emotional support provided by colleagues ("My colleagues give me emotional support when I'm having difficulties.").

Organizational variables: Nurse-Doctor Collaboration ($\alpha = .66$; 4 items): Jointly sharing information for decision making and problem solving. ("In my department, nurses and doctors work well together."). Rewards ($\alpha = .69$; 6 items): rewards in terms of bonuses or appreciation ("In this organization there are insufficient funds and/or facilities for nurses."). Personnel Resources ($\alpha = .79$; 4 items): amount and quality of personnel on a particular ward ("In my department, there are enough nurses to provide good care."). Material Resources ($\alpha = .80$; 3 items): availability and quality of materials and instruments on a particular ward ("Materials, equipment and/or instruments are not always available when necessary."). Procedures ($\alpha = .84$; 4 items): quality and feasibility of procedures ("In my department, procedures and rules are often unclear."). Internal communication ($\alpha = .63$; 5 items): communication between departments, information provision ("In this organization, one must ask a question repeatedly before getting an answer."). Because of the low Cronbach's α -score, the dimensions internal communication and nurse-doctor collaboration were excluded from further analysis.

Outcome Variables

Stress-health outcomes were operationalized in terms of job satisfaction, turnover intention, work engagement, psychosomatic distress and fatigue.

Job Satisfaction ($\alpha = .75$; 3 items): This outcome-variable from the LQWQ-N measures the extent to which nurses are satisfied with their job. ("If I had to choose now, I would take this job again").

Turnover intention ($\alpha = .85$; 3 items): This outcome-variable from the LQWQ-N measures the extent to which nurses have the intention to leave their current workplace or the job. ("I'm thinking about working in another hospital").

Work Engagement ($\alpha = .93$; 9 items) was assessed by means of the Utrecht Work Engagement Scale (UWES). The UWES has been found to have adequate consistency, reliability and validity (Seppälä et al., 2008). The items of the UWES are grouped into three subscales: Vigor ($\alpha = .81$; 3 items) ("At my work, I feel that I am bursting with energy"); Dedication ($\alpha = .86$; 3 items); ("I am enthusiastic about my job"); and Absorption ($\alpha = .82$; 3 items); ("I am immersed in my work"). All items were scored on a 7-point rating scale, ranging from 0 (never) to 6 (daily). Because of the high intercorrelations of the subscales, only the total score was used in the present study. High scores are indicative of engagement.

Fatigue ($\alpha = .93$; 20 items) was measured by means of the Dutch version of the Checklist Individual Strength (CIS-20R). The CIS-20R consists of four dimensions (subjective fatigue, concentration, motivation and physical activity) and has adequate internal consistency, reliability and validity (Vercoulen et al., 1999). Items were scored on a 7-point likert scale, ranging from 'that's correct' to 'that's not correct'. For the purposes of the present study, only the total score was used with higher scores pointing at higher levels of fatigue.

Psychosomatic distress: this variable is a sumscore ($\alpha = .87$, 19 items) of the subscales 'anxiety' ($\alpha = .87$; 6 items), 'depression' ($\alpha = .79$; 6 items) and 'somatisation' ($\alpha = .84$; 7 items), of the validated Dutch version of the Brief Symptom Inventory (BSI) (De Beurs, 2007). The BSI has been found to have adequate consistency, reliability and validity and is considered to be a good and shorter alternative for the SCL-90R (Derogatis, 1993; De Beurs & Zitman, 2005). Items were scored on a 5-point likert scale ranging from 'not at all' to 'very much'.

Ethical considerations

Every potential respondent received an invitational letter, containing information on the study and an informed consent letter. Confidentiality was guaranteed to the participants. Signed informed consent forms were obtained from the participants before data collection. Appropriate institutional review board approval was obtained for this study.

Data analysis

The statistical software package for Windows, SPSS 16.0, was used to analyze the data. Descriptive statistics (means, standard deviations, skewness and kurtosis) were computed. Chi-square test and independent samples t-test were used to compare the ER nursing sample with a general hospital nursing comparison group. Pearson correlations were calculated between predictors and outcomes. Hierarchical regression analysis was performed to estimate the strength of the association between socio-demographic characteristics (block-1), job characteristics (JDCS dimensions) (block-2) and organizational characteristics (block-3) on the one hand and the outcome variables job satisfaction, turnover intention, work engagement, fatigue, and psychosomatic distress on the other hand. A p-value of .05 or lower was considered statistically significant.

3. RESULTS

Personal characteristics

General socio-demographic variables of the emergency nurses sample (ER), as well as the general nurses sample (GN) are provided in table 1. The large majority (80 %) of the emergency nurses were holders of the specialty certificate "emergency nurse" (CEN). Their mean job experience as a nurse was 15 years ($SD=8.96$), and the mean experience as an emergency care nurse was 11 years ($SD=7.55$). Only 6% of the participants had a temporary work contract. Almost one third worked fulltime (38 hours per week) and 88% worked in changing shifts, including night shifts. All respondents participated in the in-hospital emergency care, but 58% also functioned as paramedic in ambulance care, 60% as DELTA-driver (fast rescue team) and 84% was member of an in-hospital resuscitation team. As these data are in line with official data of the Belgian Federal Government, the sample can be seen as representative (<http://www.health.belgium.be/eportal/healthcare/index.htm>).

Table 1: Comparison of demographic variables for the Emergency Room Nurses (ER) sample and the General Nurses (GN) sample.

		ER nurses N = 254	GN sample N = 669	Bonferroni Adjusted <i>p</i> Sign.
Gender	female	55.11 %	87.00 %	<i>P</i> < 0.001 ^(a)
Age	Mean (SD)	37.61 (8.82)	39.40 (9.60)	<i>P</i> < 0.05 ^(b)
Marital status:	married/cohabiting	74.00 %	74.00 %	n.s. ^(a)
Nursing degree:	bachelor	89.00 %	78.00 %	<i>P</i> < 0.001 ^(a)
Working changing shifts with night work		96.10 %	86.00 %	<i>P</i> < 0.001 ^(a)
Employment:	>32h/week	63.00 %	53.00 %	<i>P</i> < 0.05 ^(a)
Job experience as a nurse:	> 10 years	54.50 %	53.00 %	n.s. ^(a)

Sign. = significance n.s. = not significant ^(a) : Chi Square test, ^(b) : independent sample t-test

In comparison with a general hospital nurse sample (Maes, Akerboom, Van der Doef, & Verhoeven, 1999) and after Bonferroni correction for multiple comparisons, emergency nurses were found to be more frequently male, significantly younger than their colleagues and more of them had a bachelor degree. Furthermore, ER-nurses more often had to work night shifts and worked more hours per week. They did not differ in marital status or job experience.

Table 2: Comparison of the LQWQ-N predictors for the Emergency Room nurses (ER) and the General Nurses (GN)-sample

	ER-nurses N = 254 Mean (SD)	GN-nurses N = 669 Mean (SD)	Bonferroni Adjusted <i>p</i> Sign.
Job characteristics			
Work/time demands	12.04 (2.23)	13.57 (2.28)	<i>P</i> < 0.001
Physical demands	6.84 (1.86)	9.69 (2.21)	<i>P</i> < 0.001
Decision Authority	10.89 (1.55)	11.68 (1.29)	<i>P</i> < 0.001
Skill Discretion	12.46 (1.84)	11.81 (1.90)	<i>P</i> < 0.001
Social Support Supervisor	11.74 (2.60)	11.93 (2.44)	n.s.
Social Support Colleagues	12.85 (1.89)	12.50 (1.63)	<i>P</i> < 0.05
Organizational factors			
Reward	10.90 (2.60)	11.65 (2.76)	<i>P</i> < 0.001
Personnel Resources	11.64 (2.52)	11.96 (1.99)	n.s.
Material Resources	7.47 (1.51)	7.71 (1.63)	n.s.
Work Procedures	10.61 (2.10)	11.69 (1.70)	<i>P</i> < 0.001

Sign. = significance (Independent sample t-test) n.s. = not significant

In comparison with a general hospital nursing comparison group (table 2), and after Bonferroni correction for multiple comparisons, emergency nurses were found not to differ in terms of social support of their supervisor, personnel and material resources. They reported however significantly higher time pressure, more physical demands, lower decision authority, less adequate work procedures and less reward. In contrast, they reported more opportunities for skill discretion and a higher level of social support from colleagues.

Correlations

The correlations between predictors and outcomes in this sample are reported in table 3. The correlations between the predictors were all lower than .60, except for the correlation between age and job seniority ($r=.98$). Job seniority was therefore excluded from the hierarchical regression analyses.

Regression analyses

The results of the hierarchical regression analyses are reported in Table 4. With regard to job satisfaction, the regression model including only personal characteristics (block-1) explained 6% of variance. Nurses working in changing shifts, including night shifts, reported a higher degree of job satisfaction. Job characteristics (block-2) explained an additional 28% of the variance. The demand-variables did not significantly contribute to job satisfaction, whereas higher levels of skill discretion and decision authority did show a positive effect. Social support from colleagues also had a positive effect on job satisfaction. Organizational variables (block-3) explained an extra 6% of the variance in job satisfaction, with perception of rewards and appreciation as significant factors. The final model explained 40% of the variance in job satisfaction.

The personal characteristics (block-1) explained 6% of the variance in work engagement. Nurses, working in changing shifts including night shifts, scored higher on work engagement. Job characteristics (block-2) explained an additional 31% of the variance. Skill discretion and social support from the supervisor are significant predictors. Organizational variables (block-3) explained an extra 4% of the variance in work engagement. Positive perception of rewards and appreciation as well as good quality and feasibility of work procedures contribute to work engagement. The final model explained 41% of the variance in work engagement.

The personal characteristics (block-1) explained 13% of the variance in turnover intention. Both older age and female gender predicted lower turnover intention. The job characteristics (block-2) explained an additional 16% of the variance in turnover intention, with skill discretion as the strongest predictor. Organizational variables (block-3) explained an additional 3% of the variance in turnover intention, but failed to improve the regression model significantly. The final model explained 32% of the variance in turnover intention.

Table 3: Inter-correlations (Pearson correlation coefficients) for age, seniority, the dimensions of the Leiden Quality of Work Questionnaire for Nurses (LQWQ-N), the BSI-sumscore of psychosomatic distress, the total score of the Checklist Individual Strength (CIS20R) and the total score of the Utrecht Work Engagement Scale (UWES).

Measure	α	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 age	–																	
2 seniority	–	0.98**																
3 LQWQ-N W/T demands	0.78	-0.11	-0.12															
4 LQWQ-N decision authority	0.70	0.02	0.03	.18**														
5 LQWQ-N skill discretion	0.86	-0.02	0.01	0.07	0.25**													
6 LQWQ-N SS Supervisor	0.93	0.02	0.05	0.08	0.26**	0.36**												
7 LQWQ-N SS colleagues	0.85	-0.07	-0.07	-0.01	0.04	0.29**	0.36**											
8 LQWQ-N physical demands	0.78	0.08	0.07	0.31**	0.21**	0.09	0.02	-0.13*										
9 LQWQ-N person. resources	0.79	-0.01	-0.01	0.46**	0.09	0.17**	0.19**	0.11	0.15*									
10 LQWQ-N work procedures	0.84	0.14*	0.16*	0.11	0.24**	0.26**	0.40**	0.29**	0.18**	0.25**								
11 LQWQ-N material resources	0.80	0.17**	0.18**	0.11	0.23**	0.20**	0.14*	0.12	0.14*	0.20**	0.34**							
12 LQWQ-N rewards	0.69	0.02	0.02	0.23**	0.27**	0.24**	0.25**	0.05	0.34**	0.29**	0.32**	0.29**						
13 LQWQ-N job satisfaction	0.75	-0.07	-0.08	0.20**	0.29**	0.41**	0.36**	0.29**	0.16**	0.27**	0.34**	0.20**	0.42**					
14 LQWQ-N turnover intention	0.85	0.26**	0.27**	0.11	0.23**	0.35**	0.24**	0.16*	0.13*	0.20**	0.30**	0.25**	0.30**	0.56**				
15 BSI psychosomatic distress	0.87	-0.04	-0.05	0.30**	0.18**	-0.10	-0.32**	-0.12	-0.11	-0.12	-0.21**	-0.11	-0.23**	-0.25**	-0.17**			
16 CIS total (fatigue)	0.93	0.04	0.02	-0.21**	-0.17**	-0.27**	-0.27**	0.17**	-0.12	-0.10	-0.30**	-0.19**	-0.30**	-0.29**	-0.14*	0.58**		
17 UWES total (engagement)	0.93	-0.12	0.13*	0.11	0.24**	0.48**	0.39**	0.23**	0.15*	0.09	0.34**	0.15*	0.31**	0.53**	0.26**	-0.27**	0.57**	
<i>M</i>		37.61	14.78	12.04	10.89	12.46	11.74	12.85	6.84	9.61	10.61	7.47	10.9	8.21	8.75	6.16	57.81	4.05
<i>Md</i>		37	15	12	11	12	12	12	7	10	11	8	11	8	9	4	52	4.22
<i>SD</i>		8.83	8.96	2.23	1.55	1.84	2.6	1.89	1.86	1.99	2.1	1.51	2.6	1.59	1.82	7.28	24.97	0.99
<i>Range</i>		36	37	14	10	8	12	8	9	9	12	8	12	8	9	43	120	5.56

The lower part of the table provides information about the mean (M), median (Md), standard deviation (SD) and range for each variable. The first column shows the Cronbach's Alpha for each construct. Due to missing values, N ranged from 252 to 254. Abbreviations: W/T demands = work/time demands, SS=social support. α = Cronbach's Alpha * $P < 0.05$, ** $P < 0.01$

With respect to the outcome variable fatigue, the regression model including only the personal characteristics (block-1) was not significantly different from the null model. Job characteristics (block-2) explained an additional 15% of variance in fatigue, with higher work/time demands being associated with higher levels of fatigue. Organizational variables (block-3) explained an additional 6% of the variance in fatigue. Positive perception of rewards and good quality and feasibility of work procedures predicted less fatigue. The final model explained 24% of the variance in fatigue.

Finally, for the outcome variable psychosomatic distress, the regression model including only the personal characteristics (block-1) was not significantly different from the null model. Job characteristics (block-2) explained 19% of the variance in psychosomatic distress. Work/time demands predicted more psychosomatic distress whereas good social support from the supervisor predicted less psychosomatic distress. Organizational variables (block-3) explained an additional 2% of the variance in psychosomatic distress, but adding this block did not result in a significantly improved regression model. The final model explained 24% of the variance in psychosomatic distress.

Table 4: Summary of hierarchical regression analysis: personal characteristics (block 1), job characteristics (block 2) and organizational variables (block 3) as predictors of job satisfaction, work engagement, turnover intention, fatigue and psychosomatic distress.

	job satisfaction			work engagement			turnover intention			fatigue			psychosomatic distress		
	ΔR^2	β	sign	ΔR^2	β	sign	ΔR^2	β	sign	ΔR^2	β	sign	ΔR^2	β	sign
Block 1: demographics	0.06*						0.13***			0.03			0.03		
gender		0.04			0.08			-0.18	**		-0.04			0.01	
Age		-0.02		0.06*	-0.08			-0.30	***		0.03			-0.04	
degree bachelor N/Y: yes=1		0.06			0.04			0.02			-0.02			-0.01	
Work regime PT/FT fulltime=1		-0.04			0.09			0.08			0.01			0.11	
shift work+ night N/Y yes=1		0.12	*		0.12	*		-0.10			-0.11			-0.04	
possession CEN N/Y yes=1		-0.10			0.00			0.02			-0.03			-0.10	
Block 2: job characteristics	0.28***						0.16***			0.15***			0.19***		
work/time demands		0.06			0.05			-0.03			-0.21	**		-0.31	***
physical demands		0.03		0.31***	0.06			0.03			0.02			-0.01	
decision authority		0.13	*		0.03			0.08			0.00			-0.04	
skill discretion		0.17	**		0.32	***		-0.20	**		-0.12			0.06	
SS supervisor		0.11			0.17	**		-0.03			-0.11			-0.27	***
SS colleagues		0.16	**		0.06			-0.07			-0.05			-0.03	
Block 3: organizational factors	0.06***						0.03			0.06*			0.02		
Rewards		0.25	***	0.04*	0.13	*		-0.16	**		-0.17	*		0.11	
personnel resources		0.08			-0.09			-0.07			-0.13			0.12	
material resources		-0.04			-0.02			-0.06			-0.05			0.02	
work procedures		0.08			0.18	**		-0.04			-0.17	*		-0.07	
	R ²	0.40		R ²	0.41		R ²	0.32		R ²	0.24		R ²	0.24	
	Adj. R ² model	0.36	***	Adj. R ² model	0.34	***	Adj. R ² model	0.27	***	Adj. R ² model	0.17	***	Adj. R ² model	0.17	***

Abbreviations: CEN= degree of certified emergency nurse, SS= social support, PT/FT= part-time/ fulltime, N/Y=No/Yes, β =beta, ΔR^2 = change in explained variance, adj.=adjusted, sign.=significance * $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$

4. DISCUSSION

The first research question regarded the difference between emergency nurses and a general hospital nurse population. Emergency nurses seem to be confronted with more difficult work conditions as they report higher job demands, and less decision authority. This is understandable: job demands are more difficult to control and less predictable in an emergency department, while decision authority is frequently restricted by decisional urgency and medical risk. In addition, specific organizational factors are perceived as less adequate by emergency nurses in this study. In a study by Browning et al (2007), ER-nurses were also found to have the least control and autonomy, compared to nurse practitioners and nurse managers. Congruent with our results, Walsh (1998) states that inadequate work procedures are important stressors in ER-nurses. That ER-nurses feel less rewarded than their colleagues may result from the fact that they perceive their job as more demanding, due to confrontation with heterogeneous tasks and high responsibility, while they do not receive enough financial or social recognition for this (Schrivver et al, 2003).

That emergency nurses report a higher opportunity for skill discretion and a better social support by colleagues, is not surprising. Emergency departments are indeed stressful but also challenging work environments and certainly require more advanced nursing skills and knowledge. Given the fact that emergency nurses are frequently confronted with stressful situations and traumatic incidents, social support from colleagues may be more needed and appreciated (Helps, 1997; Crabbe et al., 2004; Browning et al., 2007).

The second research question regards the relationship between socio-demographic variables, work conditions or job characteristics and organizational factors on the one hand and stress outcomes on the other hand. The results of this study are in line with previous research on determinants of job stress in (emergency) nurses: personal characteristics, job characteristics, and environmental factors are predictive of occupational stress-health outcomes (Blegen, 1993; McVicar, 2003; Coomber & Barriball, 2007). As expected, the entire model predicted a large part of the variance in the job related outcome measures job satisfaction (40%), turnover intention (32%) and work engagement (39%), and a smaller but still important part of the variance in the more general outcome measures fatigue (23%) and psychosomatic distress (22%). Personal characteristics were not predictive of the outcomes fatigue and psychosomatic distress, but explained a significant part of the variance in turnover intention (13%) and also contributed to the variance in job satisfaction (6%) and work engagement (6%). As found in other studies (Burke & Greenglass, 1999), age and female gender were predictive of lower turnover intention. In the present study, shift work including nightshifts influenced job satisfaction and work engagement in a positive way. Other studies showed that participation in decisions concerning shift schedule can increase perceptions of control and prevent potential work-home conflicts (Krausz et al., 2000; McVicar,

2003; Ruggiero & Pezzino, 2006). The results therefore possibly reflect a high degree of participation in decisions concerning shift schedules.

Job characteristics including work/time demands, physical demands, decision authority, skill discretion and social support from the supervisor and colleagues explained the largest part of the variance in every outcome measure. Work/time demands was a significant predictor of fatigue and psychosomatic distress but had no significant effect on job satisfaction, turnover intention and work engagement. This effect of work/time demands is in line with earlier studies on occupational stress, showing that work demands are important determinants of psychosomatic complaints and fatigue (Bultmann et al., 2002). While some studies found work/time demands not to be related to job satisfaction (Irvine & Evans, 1995; Gelsema et al., 2005), others found the opposite (De Jonge & Schaufeli, 1998; Bradley & Cartwright, 2002). This is most probably due to the fact that work/time demands can both be experienced as a challenge, but also as a burden if they exceed a certain level. In the case of emergency nurses, work-time demands are at average significantly higher and may therefore more easily contribute to psychosomatic distress and fatigue.

The two job control dimensions, decision authority and even more so skill discretion, explained substantial parts of job satisfaction, turnover intention and work engagement. Lack of autonomy is described in earlier research as a major determinant of high levels of occupational stress in nurses (McGrath et al., 2003; Gelsema et al., 2005; Zangaro & Soeken, 2007). This can be even more so for emergency room nurses, since the content of their job implies instantaneous and autonomous decisions about life and death. In this study, social support from the supervisor was an important predictor of work engagement and psychosomatic distress. Social support from colleagues was also a strong predictor of job satisfaction. Several authors reported that lack of social support, especially by the supervisor, is a strong predictor of psychosomatic distress in emergency nurses (Helps, 1997; Yang et al., 2001; Crabbe et al., 2004; Escriba-Aguir et al., 2006). These findings emphasize the importance of participative, qualitative and empathic leadership and group cohesion in (emergency) nursing.

Organizational variables did not contribute to turnover intention or psychosomatic distress. The perception of rewards, appreciation and professional recognition was, however, a strong predictor of job satisfaction, work engagement and fatigue. Previous research supports this finding, especially in relation to job satisfaction (McVicar, 2003). Lack of reward is a strong predictor of occupational stress, since it reflects an imbalance between costs and gains that can become an increasing source of frustration and distress, ultimately leading to job disengagement (Demerouti et al., 2000; Fahlen et al., 2006; Siegrist, 2008). Although personnel resources are frequently mentioned to be a problematic issue in many general nursing journals, this dimension did not significantly contribute to the explanation of variance in any outcome measure in this study. This might be due to the fact that the structural staffing problems

are partly reflected in work/time demands, but also because staffing problems might, for obvious reasons, be solved more urgently in emergency departments than in other departments.

Finally, good work procedures contributed to the explanation of variance in work engagement and fatigue. Work procedures are indeed an important part of the work organization, as they provide clarity, uniformity and an increase in efficiency, and consequently prevent frustration (Gelsema et al., 2005). They also give nurses the opportunity to adapt more easily to their work environment, contribute to quality of care, provide a framework for good nurse-physician collaboration and help to obtain professional identity.

The high response rate, the theoretical framework and the relatively large sample of emergency nurses are important strengths of this study. A possible weakness of this study is that data from the GN-sample was gathered in one large hospital, whereas the ER-sample was assessed in a series of smaller hospitals. Another limitation is the cross-sectional design which makes causal inferences problematic. Despite these limitations, the findings of this study are in line with previous occupational stress research, while the study is innovative since it points at various important predictors, including personal and job characteristics as well as organizational factors, of stress-health outcomes in emergency nurses, some of which can be influenced by interventions.

5. CONCLUSIONS

The first conclusion from this study is that emergency nurses work under less favorable job and environmental conditions than nurses in general. For this reason, regular screening of these conditions, including job demands, control, social support, as well as specific organizational characteristics, is a necessary step in the prevention of stress-health problems in ER-nurses.

Secondly, occupational stress outcomes in emergency nurses seem to be influenced by a broad range of stressors, including job characteristics and organizational variables. The findings are in line with the recently developed Job Demands-Resources model that distinguishes between two important processes that are differently related to stress-health outcomes: a motivational process that is based on available resources such as control, social support and reward, and an energy depletion process leading to fatigue and distress that is caused by high demands (Bakker & Demerouti, 2007). In view of interventions both processes require different actions. Depletion of resources can be prevented by means of avoiding continuous exposure to demands and allowing for sufficient time for both physical and emotional recovery after confrontation with stressful events. Motivation can be enhanced by increasing control over demands, creating a more supportive environment at work and providing appreciation and a well-balanced salary.

There is indeed a strong predictive effect of the job control variables on job satisfaction, turnover intention and work engagement, while adequacy of work procedures and especially social support by the

supervisor are also important predictors. This implies that increasing the autonomy and the professional knowledge and skills of emergency nurses, together with striving for clearer and well accepted work procedures and recruiting or keeping supervisors with supportive qualities in addition to other professional competences are the best ways to invest in the wellness of emergency nurses. In the last decade, control over work demands and social support in the nursing work environment, together with clarity of procedures and tasks, gained more attention, since these dimensions are all core elements of the concept of Magnet Hospitals (Havens & Aiken, 1999). According to this conceptual framework, low levels of professional autonomy, lack of skill discretion, failing interdisciplinary communication, lack of support from the supervisor and inadequate participative leadership are predictive of higher levels of emotional exhaustion and burnout, a lower job satisfaction and higher turnover intention in health care personnel (Laschinger et al., 2001). Future longitudinal research is necessary to confirm the results of this study over time and to explore the consequences of other potential stressors, such as exposure to traumatic events. But in every respect it is important to systematically screen (emergency) nursing departments on these characteristics in order to 'care for the carers', by improving wherever possible their existing work environment.

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Chapter 3

The impact of traumatic events on emergency room nurses: findings from a questionnaire survey

Jef Adriaenssens, Veronique De Gucht, Stan Maes

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Abstract

Background: Emergency Nurses are routinely confronted with work related traumatic events and hectic work conditions. Several studies report a high prevalence of post-traumatic stress disorder (PTSD) in these nurses. Coping and social support seem to play an important role in the development of PTSD.

Objectives: This study examines (1) the frequency of exposure to and the nature of traumatic events in Emergency Nurses, (2) the percentage of nurses that report symptoms of PTSD, anxiety, depression, somatic complaints and fatigue at a sub-clinical level, and (3) the contribution of traumatic events, coping and social support to PTSD symptoms, psychological distress, somatic complaints, fatigue and sleep disturbances.

Design: cross-sectional data from 248 Emergency Nurses, from 15 Flemish (Belgian) general hospitals, were analyzed.

Results: Emergency Nurses were found to be confronted frequently with work related traumatic events. Death or serious injury of a child/adolescent was perceived as the most traumatizing event. Almost one out of three nurses met sub-clinical levels of anxiety, depression and somatic complaints and 8.5% met clinical levels of PTSD. Levels of fatigue were high but not directly related to the frequency of exposure to traumatic events. Emotional coping was related to an increase in all outcomes; avoidant coping was related to more somatic complaints; problem focused coping was related to a decrease in psychological distress and perceived fatigue. Social support from colleagues and supervisor (head nurse) was found to have a protective effect on the occurrence of PTSD symptoms.

Conclusion: Emergency Nurses are especially vulnerable to post-traumatic stress reactions due to repetitive exposure to work related traumatic incidents. This not only personally affects the nurses, but can also impact quality of care. Hospital management should act on the findings of this study and invest in supportive, communicative, empathic and anticipatory leadership, and provide time-out facilities, cognitive-behavioral interventions and psychological counseling for Emergency Nurses on demand.

1. INTRODUCTION

PTSD (Post-Traumatic Stress Disorder) is an anxiety disorder that occurs as a result of experiencing, witnessing, or being confronted with an emotionally traumatic event. A traumatic event is defined as a situation that is so extreme, so severe and so powerful that it threatens to overwhelm a person's ability to cope, resulting in unusually strong emotional, cognitive, or behavioral reactions in the person experiencing it (Meichenbaum, 1994). PTSD is characterized by three major symptom groups: (1) re-experiencing of the traumatic event, including intense fear, nightmares, horror and intrusive recollections of the event, (2) avoidance of trauma-related events and emotional numbing, and (3) chronic psychological arousal (American Psychiatric Association, 2000). The re-experiencing cluster is seen as the most important feature of the syndrome (Laposa et al., 2003). In addition, the symptoms must be present for more than one month and the disturbance should cause clinically significant distress or impairment in social, occupational, or other important areas of functioning. According to DSM-IV, PTSD may develop in three ways: (a) directly, through personal and direct exposure to a traumatic event (e.g. victims of war, extreme violence or sexual abuse), (b) by witnessing a traumatic event that involves the death, injury or suffering of another person, and (c) by learning, second hand, about a traumatic event that has been experienced by a family member or a close friend (American Psychiatric Association, 2000; Kerasiotis & Motta, 2004).

The incidence of PTSD symptoms is found to be higher in Emergency Nurses than in other nursing specialties (Figley, 1995; Boudreaux & McCabe, 2000; Alexander & Klein, 2001). In a British study, almost one third of the respondents experienced symptoms, indicative of PTSD (Helps, 1997). Another British and a Canadian study both found that about 20% of a sample of Emergency Nurses met the criteria for PTSD (Clohessy & Ehlers, 1999; Laposa et al., 2003). In two American studies, respectively 25% (Gates et al., 2011) and 33% (Dominguez-Gomez & Rutledge, 2009) met clinical cut-offs for PTSD. These figures are much higher than a PTSD prevalence of 14%, found in a population of internal/surgical ward nurses (Mealer et al., 2007).

The difference in PTSD prevalence between Emergency Nurses and nurses from other wards may be explained by a difference in exposure to traumatic events. All nurses have to deal with potentially traumatizing situations (O'Connor & Jeavons, 2003), but Emergency Nurses are routinely confronted with severe injuries, death, suicide and suffering and are also frequently exposed to verbal and physical aggression (Crabbe et al., 2004; Bennett et al., 2005; Mcfarlane & Bryant, 2007). A systematic review showed that 82% to 100% of emergency personnel are frequently exposed to work related traumatic events (Donnelly & Siebert, 2009). Another study revealed that 75% of Emergency Nurses were confronted in the past year with aggressive behavior, compared with 43% nurses of internal medicine wards, 23% of surgical wards and 9.9% of pediatric wards and gynecology. Verbal aggression over the same period was reported by 75% of Emergency Nurses, compared with 39% of their colleagues in

internal medicine wards, 25% in surgical wards and 12.4% in pediatric wards and gynecology (Winstanley & Whittington, 2004). In addition, Emergency Nurses often have to move from one traumatic event to another, leaving little time for recovery (Alexander & Klein, 2001; Gates et al., 2011; Kilcoyne & Dowling, 2007).

Although not every confrontation with traumatic events leads to PTSD, it is well known that exposure to traumatic events may have significant psychological consequences (Figley, 1995; Kerasiotis & Motta, 2004; Alden et al., 2008). Research has shown that emergency personnel reports symptoms of PTSD after professional confrontations with traumatic events, such as nightmares, recurrent images and thoughts, flashbacks, sleeping difficulties, irritability and depression, lack of interest in daily life, loss of hope in the future, amnesia, anger, loss of concentration and restlessness (Ravenscroft, 1994; Caine & Ter-Bagdasarian, 2003). These negative experiences may lead to increased absenteeism, and loss of productivity, due to a change in professional attitude. Moreover, even the quality of nursing care can be negatively altered (Donnelly & Siebert, 2009; Gates et al., 2011). One has thus to be aware that PTSD in emergency care providers can have wide-ranging effects, not only for the individuals themselves, but also for their work setting, as PTSD may lead to a decrease in job satisfaction and an increase in psychosomatic distress, sick leave and staff turnover (McIvor et al., 1997; Collins & Long, 2003).

Physiological and psychological responses to traumatic events should however be seen as a normal reaction and in most cases these responses diminish within a short period of time. In contrast, the repetitive exposure to significant stressors and/or the inability to cope effectively with the traumatic experience may result in the development of psychological disorders (Mealer et al., 2007). Repetitive exposure to traumatic events can thus be seen as an important risk factor for the development of PTSD in Emergency Nurses. From this perspective, confrontation with large scale events such as e.g. a mass collision, does not necessary have more impact than repeated, daily confrontation with small scale events. Marmar (1996) compared Emergency Nurses who witnessed a “large scale” disaster with Emergency Nurses who were repetitively confronted with “small scale” events during their daily work. No differences were found between the two groups in anxiety, depression and post-traumatic stress reactions, suggesting that repeated exposure to small scale events can indeed have serious consequences (Marmar et al., 1996; Clohessy & Ehlers, 1999).

Several authors investigated the nature and impact of traumatic events, reported by Emergency Nurses (Kerasiotis & Motta, 2004; Bennett et al., 2005; De Clercq et al., 2011; Healy & Tyrell, 2011). Research showed that Emergency Nurses are regularly confronted with a broad variety of traumatic events (De Clercq et al., 2011). The most distressing events, in decreasing order, were cot death; incidents involving children; dealing with patients’ relatives and family; confrontation with burn patients; dealing with psychiatric patients; and handling dead bodies. Furthermore, the hectic work environment and

overcrowding can hinder the recovery process and have a negative impact on the Emergency Nurse (Kilcoyne & Dowling, 2007).

In addition to type and frequency of exposure, female gender, professional seniority and more time on the job have been found to be predictors of PTSD symptoms in Emergency Nurses (Ortlepp & Friedman, 2002; Laposa et al., 2003; Dominguez-Gomez & Rutledge, 2009; Lavoie et al., 2011). Inadequate coping and lack of adequate social support may contribute to aggravation and persistence of PTSD symptoms. As far as coping is concerned, two general types of strategies can be distinguished: a problem-solving strategy and an emotion-focused strategy. Problem-solving (task oriented) coping involves attempts to do something about the stressful situation itself. Emotion-focused coping involves efforts to regulate emotions experienced because of the stressful event (Folkman & Lazarus, 1985). Both coping strategies can be active or avoidant. In more recent literature, avoidant emotional and task oriented coping is often merged and called avoidance coping (Leblanc, 2009). The effectiveness of coping strategies is time related. As a health professional, the Emergency Nurse is expected to have an active problem solving approach during an emergency care intervention. During confrontation with a traumatic event, an avoidant emotional coping strategy (e.g. distraction) can be important for the emergency care worker in order to be able to go on functioning, but in the longer term this may hinder the recovery process and can therefore lead to the development of PTSD symptoms (Clohessy & Ehlers, 1999).

Next to coping, social support can be seen as a buffer for the development of PTSD symptoms. Research showed that Emergency Nurses especially use informal resources of social support for coping with the strong emotions experienced after a traumatic event (Fernandes et al., 1999; Battles, 2007). Having a supportive social network and being able to talk things over with colleagues, was found to have a strong preventive effect on the development of PTSD (Lavoie et al., 2011). Lack of social support and poor team communication on the contrary has been found to be related to higher levels of fatigue, burnout and post-traumatic stress responses among emergency personnel (Van der Ploeg & Kleber, 2003).

2. THE STUDY

Objectives

The aim of the present study was: (1) to examine the frequency of exposure to and the nature of traumatic events in Emergency Nurses; (2) to examine what percentage report symptoms of post-traumatic stress, anxiety and depression, somatic complaints, sleep problems and fatigue reaching a sub-clinical or clinical cut-off, and (3) to study the contribution of frequency of traumatic events, coping and perceived social support to PTSD symptoms, psychological distress (anxiety and depression), somatic complaints, fatigue and sleep problems in Emergency Nurses.

Methods and procedures

Study design, setting and participants

This cross-sectional study was carried out in the Emergency Department of 15 Belgian (Flemish) general hospitals, by means of a self-administered structured survey, from December 2007 until March 2008. Fifteen hospitals were selected from all over Flanders, in order to have a representative sample that met criteria for an optimal sample size (Raosoft Inc. sample size calculator). Every potential respondent received an invitational letter, containing information on the study, and an informed consent form. The first author, who is an Emergency Nurse, visited every Emergency Department and provided information on the objectives and the relevance of the study. Afterwards, the head nurse distributed the paper questionnaire to the Emergency Nurses. Each respondent was asked to fill in the questionnaire individually in his/her leisure time. One reminder was sent one month after the start of data collection. The completed questionnaires could be deposited anonymously in a sealed mailbox in the Emergency Department. The mailboxes were collected by the first author two months after the distribution of the questionnaires. The eligible population consisted of all the Emergency Nurses who had patient contact (n=302) and were working at least six months in an emergency care unit. Head nurses and nursing managers were excluded from the sample. A total of 248 completed questionnaires were returned (response rate 80.5%).

Measures

Predictors

Socio-demographic variables

Data was gathered on the socio-demographic status of each respondent, including age, gender, work regime (as part- or fulltime), marital status, children living at home, education, seniority, shift work and task diversity (in-hospital emergency service, ambulance nurse, fast rescue team nurse, resuscitation team nurse).

Frequency of exposure

Every respondent was asked how many times he/she was confronted with a work-related traumatic event in the past 6 months, and which work-related event had the highest impact. A work-related traumatic event was defined as “a self-experienced traumatizing event, directly related to the work of the respondent”. Conflicts with colleagues or supervisors, and events that occurred in the private life of the respondent were excluded.

Coping strategy

In the present study, the Coping Inventory for Stressful Situations (CISS-21) (Endler & Parker, 1990; Schwarzer & Schwarzer, 1996; Cohan et al., 2006) was used to assess the coping strategies of the respondents. This instrument differentiates between three types of coping: emotion-oriented (emotion focused) (7 items), task oriented (problem focused) (7 items), and avoidant (avoidant emotion focused or problem focused) coping (7 items). Respondents are asked to focus on a recently experienced (in the last six months) traumatic event and to indicate to which extent statements are applicable to them, using a five-point rating scale, from 'not at all' to 'very much'. Sum scores were calculated for each of the three subscales.

Social support

Social support from a supervisor and colleagues was measured by means of two subscales of the Leiden Quality of Work Questionnaire for Nurses (LQWQ-N) (Maes et al., 1999; Gelsema et al., 2005). Social support is defined as 'the feeling that one is cared for and has assistance available from other people' and 'that one is part of a supportive social network'. Social support supervisor (4 items) measures perceived social support by the supervisor (e.g. "I feel appreciated by my direct supervisor."). Social support colleagues (4 items) measures perceived instrumental and emotional support by colleagues (e.g. "My colleagues give me emotional support when I'm having difficulties."). This questionnaire was derived from the Leiden Quality of Work Questionnaire (LQWQ) (Van der Doef & Maes, 1999). The items of the LQWQ-N are occupation specific. In homogeneous samples, occupation specific instruments are preferred over general measures, as they explain more variance in relevant outcome variables (Van der Doef & Maes, 2002). The factor structure of the LQWQ-N was found to be stable and robust by means of factor analyses and reliability analyses (Van der Doef & Maes, 1999). All items are formulated as statements that have to be rated on a 4-point Likert scale, ranging from 'totally disagree' to 'totally agree'.

Outcome variables

Post-traumatic stress reactions: The Impact of Event scale (IES) (Horowitz et al., 1979; Van der Ploeg et al., 2004) was used to determine the frequency of post-traumatic stress symptoms, in relation to a recently experienced (in the last six months) work-related traumatic event. The respondent was asked to give a brief description of this event. The IES consists of two subscales: 'Intrusion' (7 items), measuring the preoccupation with the traumatic experience, repeated thoughts or nightmares about the experience and a recurrent need to talk about it (e.g. "I had waves of strong feelings about it.") and 'avoidance' (8 items) measuring self-reported avoidance of certain ideas, feelings, or situations, related to the traumatic event (e.g. "I stayed away from reminders of it."). All items are rated on a 4-point Likert scale. In the present study, only the total score (sum score of the two dimensions) of the IES was used

(15 items), with higher scores being indicative of stronger post-traumatic stress reaction. Normative values for respondents without trauma history, as defined by Briere & Elliot (1998), were used to compare with the scores of the Emergency Nurses. A cut-off of 20 on the IES was used to differentiate between a mild and a moderate (sub-clinical) level (Orsillo, 2001), and a cut-off of 26 was used to distinguish between Emergency Nurses for whom confrontation with traumatic events had a moderate or a major (clinical) impact in terms of symptoms (Corneil et al., 1999), as a respondent with a score of 26 or higher on the IES has a probability of 75% or more having PTSD (Coffey & Berglind, 2006).

Psychological distress and somatic complaints were assessed by means of the validated Dutch version of the Brief Symptom Inventory (BSI). Only the subscales 'anxiety' (6 items), 'depression' (6 items) and 'somatization' (7 items) were used for this study. The BSI has been found to be a good and shorter alternative for the SCL-90R (Derogatis, 1993; De Beurs & Zitman, 2005). This instrument assesses the presence of specific symptoms in the past week. Items are rated on a 5-point likert scale ranging from 'not at all' to 'very much'. Higher scores are indicative of more problems in a specific dimension. 'Psychological distress' (19 items) was constructed as a sum score of the dimensions anxiety and depression. Normative values for healthy subjects, as defined by De Beurs & Zitman (2005), were used to interpret the score of the Emergency Nurses. The cut-offs defined by De Beurs & Zitman (2005) were used to examine how many Emergency Nurses reached a sub-clinical and clinical level of anxiety, depression and somatic complaints.

Fatigue was measured by means of the Dutch version of the Checklist Individual Strength (CIS-20R) (Vercoulen et al., 1999). This instrument assesses the presence of fatigue symptoms in the past two weeks. The CIS-20R consists of four dimensions (20 items). The main dimension is subjective experience of fatigue (perceived fatigue) (8 items), (e.g. "I'm feeling weak"). For the purpose of this study only this main dimension was used. The CIS-20R was initially constructed for patients with Chronic Fatigue Syndrome but is also applicable to healthy populations (Beurskens et al., 2000). Items are rated on a 7 point Likert scale ranging from 'Yes, that's correct' to 'No, that's not correct'. A higher score is indicative of a higher level of fatigue. Normative values for healthy subjects were used to interpret the scores of the Emergency Nurses (Vercoulen et al., 1999). A cut-off of 35 for the main dimension was used to define clinical levels of fatigue (De Vree et al., 2002).

Sleep Problems were assessed by a self-administered questionnaire, consisting of three questions, based on the DSM IV-criteria for sleep disorders (American Psychiatric Association, 2000) and including initiation, duration and maintenance of sleep (3 items) (e.g. "I have a restless or disturbed sleep"). Items were rated on a 5-point likert scale ranging from 'not at all' to 'very much'. This instrument assesses the presence of sleep problems during the past week. A higher score is indicative of worse sleep quality. Based on DSM-IV-TR (American Psychiatric Association, 2000) and the results from the America Insomnia

Survey (Kessler et al, 2010), scoring higher than four on two or more criteria was considered as indicative of a clinical sleep disturbance.

Ethical considerations

Approval from the ethical committee of Leiden University for this study was obtained. Confidentiality was guaranteed to all participants. Informed consent was signed by each respondent before data collection.

Statistical methods

The statistical software package for Windows, SPSS 18.0, was used for data analysis. Descriptive statistics (means, standard deviations, skewness and kurtosis) were computed. Pearson correlations, One Way ANOVA and Independent Sample-t tests were calculated between predictors and outcomes. Normality of distribution was assessed by the Kolmogorov-Smirnov test. The dimensions anxiety, depression, somatic complaints, sleep disturbances, fatigue, the total score of the impact of event scale and frequency of exposure were found to be skewed. Abnormal distributions were corrected wherever necessary, according to Tabachnick and Fidell (1996), by using square root, logarithmic or inverse correction methods, depending on the degree of abnormality. Hierarchical regression analyses were conducted to estimate the strength of the association between demographic characteristics (block-1), frequency of exposure (block-2), coping strategy (block-3) and social support (block-4) and the outcome variables IES total score, psychological distress, fatigue, somatic complaints and sleep problems. The sample size of 248 respondents would allow for about 25 predictors to be entered in the regression models, which is well above the number of predictors used in this study (Green, 1991). A p-value of 0.05 or lower was considered statistically significant.

3. RESULTS

Personal characteristics

The majority of the Emergency Nurses were female (55.6%). The mean age of the respondents was 37.76 years (SD 8.73). Almost 74% was cohabiting and 42% had no resident children. Most of the Emergency Nurses had a bachelor degree. The mean job experience (seniority) in emergency care was 11.21 years (SD 7.47). Almost one third of the Emergency Nurses worked full time (38 hours/week) and 88.7% worked in changing shifts, including night shifts. All of the respondents participated in in-hospital emergency care, but a major proportion also participated as nurses in emergency out-hospital services: 58% as an ambulance-nurse and 60% as a DELTA-nurse (fast rescue team). Further, 84% were members of an in-hospital resuscitation team. As these data are in line with the official database of the Belgian Federal Government the sample can be seen as representative ([Http://www.health](http://www.health).

belgium.be/eportal/healthcare/index.htm). After Bonferroni correction for multiple comparisons, male Emergency Nurses were found to have higher levels of fatigue than their female colleagues (MD = 6.75, $t = 2.15$, $p = .029$) and Emergency Nurses, working full time, were found to have higher levels of psychological distress than their colleagues working part time (MD = - 0.14, $t = -2.49$, $p = .014$). No differences in the outcome variables could be identified for marital status, children living at home, educational level, shift work and task diversity.

Table 1: Nature of traumatic events in order of the percentage of respondents (N=219) mentioning an event as the most distressing one

Top 10 of traumatic events reported by ER-nurses		%
1.	dealing with sudden death of young persons	31.6
2.	dealing with death or resuscitation of a baby or young child	25.6
3.	handling victims of car & train crashes (alive and death)	15.1
4.	confrontation with physical trauma & burns patients	8.7
5.	dealing with suicide	4.6
6.	dealing with aggression, violence & threat	3.9
7.	inability to deliver good quality of care	3.2
8.	inability to help chronically ill patients	2.9
9.	dealing with relatives of victims/patients	2.5
10.	confrontation with child abuse & negligence	1.1

Frequency of exposure to and type of traumatic events

Thirteen percent of the respondents reported no confrontation with a traumatic event in the last 6 months, 15% reported only one event, 32% two or three events, 23% four or five events and 17% reported six events or more.

Table 1 shows the nature of the traumatic events the respondents were confronted with in the previous six months, and the percentage of respondents who mentioned an event as the most distressing one. 'Dealing with the sudden unexpected death of a young person' and 'dealing with death or resuscitation of a baby or a young child' were considered to be the most distressing event by 31.6% and 25.6% of the nurses respectively.

Table 2: Comparison of the outcome variables for the respondents of this study (N=247) with normative data and the number (percentage) of respondents reaching the sub-clinical and clinical cutoffs for anxiety, depression, somatic complaints and PTSD and the clinical cutoff for sleep problems and perceived fatigue.

Outcome variable	Mn (SD)	Sign.	Cutoff	Sub-clinical Level	Cutoff	Clinical Level
Anxiety (BSI)				N (%)		N (%)
ER-nurses sample	0.35 (0.46)	n.s.	0.42 -1.37	80 (32,4 %)	≥ 1.38	6 (2.4 %)
normative sample	0.33 (0.51)					
Depression (BSI)				N (%)		N (%)
ER-nurses sample	0.35 (0.53)	n.s.	0.36 -1.73	71 (28.7 %)	≥ 1.74	10 (4.0 %)
normative sample	0.31 (0.53)					
Somatic Complaints (BSI)				N (%)		N (%)
ER-nurses sample	0.26 (0.37)	n.s.	0.23 -1.36	92 (37.2 %)	≥ 1.37	6 (2.4 %)
normative sample	0.32 (0.53)					
Sleep Problems						N (%)
ER-nurses sample	1.14 (1.12)	-----			$\geq 2 \times \text{score}$	
normative sample	-----				≥ 4	17 (6,9 %)
PTSR (total score IES)				N (%)		N (%)
ER-nurses sample	11.90		20-25	60 (24.3 %)	≥ 26	21 (8.5 %)
normative sample	8.10	.002				
Missing				6 resp.		6 resp.
Perceived Fatigue (CIS20R)						N (%)
ER-nurses sample	28.36	<.001			> 35	
normative sample	17.30					71 (28.7 %)

Normative data and cutoffs: for BSI (De Beurs & Zitman, 2005), sleep problems (Kessler et al., 2010), IES (Briere & Elliot, 1998; Orsillo, 2001; Corneil et al., 1999) and CIS20R (Vercoulen et al 1999).

Abbreviations: sign = significance, n.s. = not significant, resp. = respondents

Psychological and somatic consequences

The number and percentage of respondents reaching sub-clinical and clinical cut-offs for the different outcomes can be found in table 2. The normative data of the BSI dimensions anxiety, depression and somatic complaints for a Dutch sample of non-psychiatric respondents were used for comparative purposes. For none of the dimensions a significant difference was found between the mean scores of the Emergency Nurses and the normative group. A sub-clinical cut-off and a clinical cut-off score were determined according to De Beurs & Zitman (2005). For the dimension 'anxiety', 32.4% of the respondents exceeded the sub-clinical cut-off score, while 2.4% reached a clinical level of anxiety. For the dimension 'depression', 28.7% of the Emergency Nurses scored above the sub-clinical cut-off, while 4.0% had a clinical level of depression. Finally, for the dimension 'somatic complaints', 37.2% of the respondents exceeded sub-clinical levels while 2.4% scored above the clinical cut-off point.

For the dimension sleep problems, a cut-off was used, based on the scores on the 5-point likert scale. Nurses who scored 4 ('pretty much') or 5 ('very much') on two or three items were considered clinical cases, resulting in 6.9% of the respondents who reached a clinical level.

The mean score for the Emergency Nurses on the IES was significantly higher than the normative sample. In accordance with Corneil and colleagues (1999) a total score of 20 was used as a sub-clinical cut-off and a score of 26 or higher was used as a clinical cut-off, considered to be indicative of a traumatic stress reaction with likelihood of PTSD. In the present study, almost one in four respondents scored above the sub-clinical cut-off, and 8.5 % reached clinical levels of PTSD symptoms.

For the outcome perceived fatigue, the mean score on the main dimension of the CIS-20R was significantly higher than the normative sample of healthy subjects (Vercoulen et al., 1999). In the present study, 28.7% of the respondents reached the clinical cut-off score.

Correlations

The correlations between independent and dependent variables are reported in table 3, together with descriptive data for each variable and a Cronbach's alpha for each construct. Correlations between the independent variables were all lower than .60, except for the correlation between age and job seniority ($r = .98$). Job seniority was therefore excluded from the hierarchical regression analyses.

Table 3: Inter-correlations (Pearson correlation coefficients) for age, seniority, frequency of exposure, the dimensions of the Coping Inventory for Stressful Situations (CISS), the dimensions social support supervisor and social support colleagues from the Leiden Quality of Work Questionnaire for nurses (LQWQ-N), the total score of the impact of event scale (IES), psychological distress, somatic complaints, the subjective experience of fatigue score (perceived fatigue) of the Checklist Individual Strength (CIS-20R) and sleep problems, together with descriptive data for every variable.

Measure	α	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Age	---	--												
2 Seniority	---	,97**	--											
3 Frequency of exposure	---	,04	,07	--										
4 CISS avoidance	.69	-,22**	-,20**	,17**	--									
5 CISS emotion	.74	-,02	-,01	,19**	,42**	--								
6 CISS task	.80	-,01	00	,20**	,32**	,12	--							
7 Social support supervisor	.93	,03	,06	,05	-,01	-,15*	,15*	--						
8 Social support colleagues	.85	-,08	-,08	,01	,10	-,02	,14*	,36**	--					
9 IES total (PTSR)	.95	,06	,08	,26**	,20**	,29**	,11	-,19**	-,12	--				
10 Psychological distress	.88	-,06	-,08	,17**	,15*	,45**	-,09	-,33**	-,12	,13*	--			
11. Somatic complaints	.84	,03	,02	,19**	,16**	,25**	-,08	-,24**	-,10	,13*	,58**	--		
12 CIS-20R perceived fatigue	.88	-,02	-,03	,10	,13	,39**	-,13*	-,26**	-,17**	,17**	,60**	,49*	--	
13 Sleep problems	.87	,02	,03	,18**	,13	,28**	-,06	-,20**	-,13*	,20*	,53**	,52**	,40**	--
	<i>M</i>	37,76	11,21	3,39	11,25	9,41	14,95	11,74	12,87	11,90	0,35	0,26	28,36	1,14
	<i>Md</i>	37,00	10,00	2,48	11,00	9,00	15,00	12,00	12,00	8,00	0,17	0,14	15,00	1,00
	<i>SD</i>	8,73	7,47	3,0	4,05	3,97	4,04	2,62	1,90	12,78	0,44	0,37	13,09	1,12
	<i>ran</i>	36	36	8,0	18	24	19	12	8	71	2,92	2	60	4

Abbreviations: PTSD: post-traumatic stress reactions, α = Cronbach's Alpha * $p < .05$, ** $p < .01$

Table 4: Summary of hierarchical regression analysis: personal characteristics (block 1), exposure to traumatic events (block 2), coping strategy (block 3) and social support (block 4) as predictors of post-traumatic stress reactions, psychological distress, perceived fatigue, somatic complaints and sleep problems.

	IES total			Psychological distress			Perceived fatigue			Somatic complaints			Sleep problems		
	ΔR^2	β	sign.	ΔR^2	β	sign.	ΔR^2	β	sign.	ΔR^2	β	sign.	ΔR^2	β	sign.
Block 1: demographics	0,01			0,02			0,02			0,01			0,01		
sex (Male=1 / Female = 2)		-,02			-,07			-,17	**		-0,04			-,07	
age		,04			-,04			,03			0,04			,04	
work regime (PT=1 / FT=2)		-,07			,08			-,03			-0,01			,06	
Block 2: exposure	0,10***			0,03**			0,01			0,03**			0,03**		
frequency of exposure		,23	***		,15	*		,04			0,17	**		,16	**
Block 3: coping	0,07***			0,19***			0,19***			0,07***			0,08***		
CISS avoidance		,09			,01			,01			0,15	*		,07	
CISS emotion		,20	**		,38	***		,39	***		0,14	*		,23	***
CISS task (problem focused)		,03			-,14	*		-,18	**		-0,11			-,11	
Block 4: social support	0,04**			0,06***			0,04**			0,04**			0,03		
social support supervisor		-,16	**		-,24	***		-,13	*		-0,17	**		-,11	
social support colleagues		-,07			-,04			-,13	*		-0,06			-,09	
	R ² model	0,22		R ² model	0,30		R ² model	0,26		R ² model	0,15		R ² model	0,16	
	adj R ² model	0,20	***	adj R ² model	0,27	***	adj R ² model	0,22	***	adj R ² model	0,12	***	adj R ² model	0,12	***

Abbreviations: IES = impact of event scale, β = beta, PT/FT: part-time/full-time, ΔR^2 = change in explained variance, adj. = adjusted, sign. = significant

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

Regression analyses

Hierarchical regression analyses was performed to estimate the strength of the association between demographic characteristics (block-1), frequency of exposure (block-2), coping strategy (block-3) and social support (block-4) on the one hand and the outcome variables IES total, psychological distress, perceived fatigue, somatic complaints and sleep problems, on the other hand. The results of these hierarchical regression analyses are reported in table 4.

With respect to the IES total score, measuring the severity of post-traumatic stress reactions, the regression model including only personal characteristics (block-1) did not significantly differ from the null model. Frequency of exposure (block-2) explained the biggest part of the variance (10%). Coping strategies (block-3) explained an additional 7% of variance, with emotional coping being associated with an increase in post-traumatic stress symptoms. Social support (block-4) explained an extra 4% of the variance. Better perceived social support from the supervisor was associated with less PTSD-complaints. The final model, including all four blocks, explained 22% of variance in PTSD symptoms.

With regard to psychological distress, the regression model including only personal characteristics (block-1) did not significantly differ from the null model. Frequency of exposure (block-2) explained an additional 3% of the variance in this variable. Coping strategies (block-3) explained the biggest part of the variance (19 %). Emotional coping was associated with more distress, and task oriented coping was associated with less distress. Social support (block-4) explained an extra 6% of the variance. Adequate social support from the supervisor was significantly related to less distress. The final model, including all four blocks, explained 30% of the variance in psychological distress.

Neither the personal characteristics (block-1), nor frequency of exposure (block-2) significantly contributed to the fatigue outcome. Coping strategies (block-3) explained the major part of the variance (19%), with emotional coping being related to higher scores, and task oriented coping with lower scores for fatigue. Social support (block-4) added an extra 4% to the explained variance for this outcome. Adequate social support from the supervisor and from colleagues were both associated with less fatigue. The final model, including all four blocks, explained 26% of variance in this variable.

With regard to somatic complaints, the regression model including only personal characteristics (block-1) did not significantly differ from the null model. Frequency of exposure (block-2) explained 3% of the variance. Coping (block-3) explained 7% of variance, with avoidant and emotional coping being associated with more somatic complaints. Social support (block-4) added an extra 4% of explained variance. Adequate social support from the supervisor was associated with fewer complaints. The final model, including all four blocks, explained 15% of the variance in somatic complaints.

Finally, for sleep problems the regression model including only personal characteristics (block-1) was not significantly different from the null model. Frequency of exposure (block-2) explained 3% of the variance. Coping strategies (block-3) explained an additional 8% of variance: emotional coping was significantly associated with more sleep problems. Adding social support (block-4) to the model did not significantly increase the amount of explained variance. The final model, including all four blocks, explained 16% of variance in sleep problems.

4. DISCUSSION

Key results

The first research question concerns the frequency of exposure to and the nature of traumatic events in Emergency Nurses. As far as frequency of exposure is concerned, most of the Emergency Nurses in the present study were regularly confronted with traumatic events. As many as 87% of them reported confrontation with one or more traumatic events over the last six months. These results show a difference with findings in a general nurses population, indicating that 42% of respondents had not experienced a traumatic event in the last year (O'Connor & Jeavons, 2003). In line with our results, a British study on ambulance workers, consisting of nurses and ambulance technicians, found that 82% of the respondents had experienced a particularly disturbing event in the previous six months (Alexander & Klein, 2001). It is obvious that a general nurses population is less exposed to traumatic events than Emergency Nurses, who are, in terms of exposure, more comparable to ambulance personnel.

With respect to the type or nature of traumatic events that were encountered, confrontation with sudden death, especially of children and adolescents, is most frequently reported as the most distressing event in Emergency Nurses. Other impactful events included the exposure to serious injury and mutilation of victims of vehicle crashes, dealing with grief of family and relatives, and confrontation with (potentially) dangerous situations. These findings are in line with previous research (Alexander & Klein, 2001; Regehr et al., 2002; Jonsson et al., 2003; Laposa et al., 2003). According to our findings, Emergency Nurses are regularly confronted with potentially traumatizing events. This is consistent with previous research, indicating that the frequency of exposure to traumatic events in emergency care is high and almost continuous (Clohessy & Ehlers, 1999; Marmar et al., 1996).

The second objective of the study was to examine to what extent Emergency Nurses report sub-clinical and clinical levels of post-traumatic stress, anxiety and depression, somatic complaints, sleep problems and fatigue. The results of the study show that a substantial part of the Emergency Nurses (ranging from 28.7% to 37.2%) exceeded sub-clinical levels of both psychological distress and somatic complaints. Additionally, almost one in four Emergency Nurses exceeded the sub-clinical cut-off for PTSD-symptoms. Moreover, 28.7% of the respondents reached clinical scores for fatigue and 8.5% of the respondents

reached a clinical level for PTSD. These scores are alarmingly high and may even be an underestimation since some Emergency Nurses, eligible for the study, were on sickness leave at the time of this survey.

The third and final aim of the study was to examine the impact of traumatic events, coping and perceived social support on PTSD symptoms, psychological distress (anxiety and depression), fatigue, somatic complaints and sleep problems in Emergency Nurses. The results of the present study show that exposure to traumatic events is strongly related to PTSD symptoms and – to a lesser extent - to the other outcome variables, with the exception of fatigue. This can be explained by the fact that these other outcome variables are of a more general nature and are therefore less sensitive to reflect the direct impact of traumatic events. While there is no direct effect on fatigue, there is a strong relationship between coping and fatigue. The same effect was also found in previous research (Samaha et al., 2007). The development of fatigue may thus be a secondary effect, depending on the way Emergency Nurses are coping with the event. It is however important to note that the explained variance in the various outcomes was modest to low. This is especially true for somatic complaints and sleep problems. As a consequence, these results should be interpreted with care.

In the present study, emotion focused coping was significantly related to all outcome variables with the strongest relations being found for psychological distress and fatigue. Avoidant coping was associated with an increase in somatic complaints. An active, problem focused (task oriented) coping strategy was related to less psychological distress and fatigue. Previous research confirms this finding: emotional coping is a self-oriented emotional reaction to reduce stress (e.g. blaming oneself for being too emotional, angry, tense, self-preoccupied and fantasizing) that is frequently not successful in nurses. These reactions do often even increase the stress reaction (Jaracz et al., 2005; Watson & Sinha, 2008). Avoidant coping efforts, such as denial, mental disengagement, wishful thinking and emotional suppression of intrusion are experienced as unhelpful by Emergency Nurses (Alexander & Klein, 2001) and even have a long term negative effect on wellbeing (Clohessy & Ehlers, 1999). In contrast, task- or problem-oriented coping efforts (e.g. actually trying to solve or restructure the problem or attempt to alter the situation) are often seen as successful because they imply feelings of control, influence, commitment and resilience (Beasley et al., 2003; Jaracz et al., 2005).

Lack of social support is a significant predictor of occupational stress in Emergency Nurses, especially in relation to daily work conditions and organizational circumstances (Adriaenssens et al., 2011). In the present study, social support was found to have a small but significant effect on all outcome variables. The difference in importance between coping and social support as predictors, may be due to the fact that questions related to coping were answered in direct relation to stressful events, while questions related to social support regarded perceptions of the more general work context. As known from previous studies, more general questionnaires tend to explain lower amounts of variance in specific outcomes (Van der Doef & Maes, 2002). Despite this, qualitative social support from the supervisor was

associated with less Post-Traumatic Stress Reactions, psychological distress, somatic complaints and fatigue, while adequate social support from colleagues was associated with less fatigue in this study. These results confirm that the occupational social network can facilitate the recovery process (Ozer et al, 2003). There is a substantial body of knowledge showing that individuals, who have access to social support in stressful situations, seem to be better off than individuals without significant social support (Hamaideh, 2012; Hayes et al, 2010; Bradley & Cartwright, 2002). Social support is even found to be beneficial on endocrine and immune system parameters (Leblanc, 2009).

Implications of the study

This study shows that Emergency Nurses are regularly exposed to occupation-related traumatic incidents, with significant negative effects on psychological and physical wellbeing. This is an important finding, not only for the Emergency Nurse but also for the hospital management, because these effects may generate a rise in sickness absence, a decrease in task performance and job satisfaction, a rise in turnover intention, and even a decrease in quality of care (Van Bogaert et al., 2010; Slatten et al., 2011). Screening and mentoring of high-risk individuals should therefore be considered, particularly following a major traumatic event or cumulative exposure (McFarlane et al, 2007; Healy & Tyrell, 2011).

This study shows a relatively strong relationship between coping strategies and the different outcomes. In the last decade, several intervention techniques have been described to improve the coping effectiveness of health care workers and to prepare them for future exposure. A Cochrane Review by Ruotsalainen et al (2008) examined the literature on interventions that include a cognitive behavioral approach (e.g. coping skills training, anticipatory coping interventions), eventually combined with relaxation techniques. The review found a significant effect on burnout, anxiety, stress and somatic symptoms in health care workers, compared with no intervention. In some studies, the effects were still present from six months to two years after the end of the intervention (Marine et al., 2008). This is congruent with previous research, showing that nurses who adopt a pro-active (anticipatory) coping style show more resilient behavior and report lower levels of depression (Greenglass et al., 2002; Kravits et al., 2010). Hospital management and supervisors therefore need to anticipate the effects of traumatic exposure, by teaching emergency personnel evidence based anticipatory methods of coping with stressful events (Laal & Aliramaie, 2010, McFarlane et al., 2007). In addition, after confrontation with a traumatic event, psychological guidance and counseling should be provided for exposed Emergency Nurses.

This study also shows that adequate social support from the supervisor was available and important for the Emergency Nurses. This is an argument for supportive, communicative, empathic and anticipatory leadership. Qualitative leadership can establish a supportive culture, with good team spirit and good interpersonal and interdisciplinary communication, that is appreciative of staff and demonstrates a

recognition of, and concern for, the stressful effects of traumatic events (Healy & Tyrell, 2011). In line with the findings of this study, research on Emergency Nurses shows that existing resources for social support are often preferred over obligatory official group debriefings (Fernandes et al., 1999; Jonsson et al., 2003; Battles, 2007).

Strengths and limitations of the study

The high response rate and the relatively large sample of Emergency Nurses are important strengths of this study. Due to the cross-sectional design of the study, one cannot draw conclusions regarding causal relationships. The findings of this study are nevertheless in line with previous research on exposure to traumatic events. In addition, although the response rate of this study was high (80.5%) the data are collected by means of convenience sampling. Despite this, the sample proved to be representative. Although most of the measures that we used were validated, we also used a self-constructed sleep problem scale that is however based on DSM IV criteria. As a consequence, the results related to sleep should be interpreted with caution. This is especially true for the definition of a clinical level of sleep problems. Despite some limitations, this study is innovative since it points at important predictors of post-traumatic stress in Emergency Nurses. All of these predictors need attention and most of them can be influenced by managerial initiatives, group cohesion-enhancing interventions and supportive leadership.

5. CONCLUSIONS

Emergency Nurses are confronted regularly with traumatic events and are thus vulnerable for developing PTSD. Repetitive exposure can result in the development of significant psychological disorders (Blumenfield & Byrne, 1997; Mealer et al., 2007). The results of this study show that levels of anxiety, depression and somatic complaints and post-traumatic stress reactions are indeed high. Almost a third of the respondents exceeded a sub-clinical level for these variables. Moreover, one out of seven Emergency Nurses reached clinical levels for PTSD. Frequency of exposure to traumatic events was strongly related to symptoms of PTSD and to a lesser degree to psychological distress, somatic complaints and sleep problems. Levels of fatigue in Emergency Nurses were found to be high, but were not directly related to the frequency of exposure itself, which might be due to an indirect effect of coping. Future research should explore this hypothesis.

Coping was found to be strongly associated with the reaction of the Emergency Nurse after exposure to traumatic events. Emotional and avoidant coping was not a successful strategy to deal with the event. In contrast, problem focused coping was related to less psychological distress and fatigue. Social support was found to have a protective effect on post-traumatic stress reactions. A final thought is that Emergency Nurses with personality characteristics such as strong stress resistance and resilience, a high level of role autonomy and independence, the ability to shift gears and accelerate pace as needed, good

multi-tasking skills and the talent to maintain calm amidst chaos may react more adequately to traumatic events (Stathopoulou et al., 2010). Future studies should explore whether this is indeed the case and whether nurses with certain personality characteristics, professional goals and/ or coping strategies are less vulnerable following exposure to traumatic events than others.

This study shows that Emergency Nurses are at risk for post-traumatic stress reactions due to repetitive exposure to work related traumatic incidents. This not only affects the Emergency Nurse personally, but also the environment they work in, and likely impacts on the quality of care provision and the job satisfaction of nurses.

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Chapter 4

Causes and consequences of occupational stress in emergency nurses, a longitudinal study.

Jef Adriaenssens, Veronique De Gucht, Stan Maes

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Abstract

Aim: This longitudinal study examines the influence of changes over time in work and organizational characteristics on job satisfaction, work engagement, emotional exhaustion, turnover intention and psychosomatic distress in emergency room (ER)-nurses.

Background: organizational and job characteristics of nurses are important predictors of stress-health outcomes. ER-nurses are particularly exposed to stressful work-related events and unpredictable work conditions.

Method: The study was carried out in 15 ER-departments of Belgian general hospitals in 2008 (T1) and 18 months later (T2) (N=170).

Results: Turnover rates between T1 and T2 were high. Important changes over time were found in predictors and outcomes. Changes in job demand, control and social support predicted job satisfaction, work engagement and emotional exhaustion. Additionally, changes in reward, social harassment and work agreements predicted work engagement, emotional exhaustion and turnover intention respectively.

Conclusions: Work related interventions are important to improve occupational health in ER-nurses and should focus on lowering job demands, increasing job control, improving social support, and a well-balanced reward system.

Implications for Nursing Management: Nursing managers should be aware of the causes and consequences of occupational stress in ER-nurses in order to enable preventive interventions.

1. INTRODUCTION

According to a recent review of the literature (Lu et al, 2012) the current nursing shortage and high turnover is of great concern in many countries. These phenomena prove to be closely related to job satisfaction, working conditions, job stress, role conflict and ambiguity, and professional and organizational commitment. In comparison to other areas of nursing, such as general ward nurses, Emergency Room (ER) nurses are confronted with more acute and traumatic stressors and unpredictable work conditions, resulting in higher levels of burnout (Potter, 2006; Browning *et al.*, 2007). In the present study we aim to obtain a better understanding of the determinants and consequences of occupational stress in emergency nurses based on a solid theoretical framework.

Overview of the literature

ER-nurses seem to be exposed to a broader variety of stressors as well as more severe stressors than their colleagues from other nursing departments. They frequently have to deal with acute, potentially traumatic experiences, such as threat, aggression and violence at work (Crabbe, 2004; Kilcoyne & Dowling, 2007) as well as death, mutilation and suffering (Clohessy & Ehlers, 1999; Adriaenssens, De Gucht & Maes, 2012). Other studies have suggested the presence of chronic stressors such as high time pressure and high physical demands, low decision latitude, less adequate work procedures, tension with colleagues and shift work (Clohessy & Ehlers, 1999, Adriaenssens et al., 2011). Moreover, ER-nurses have to deal with constantly changing, hectic and hardly predictable work conditions (Hooper et al., 2010; Healy & Tyrell, 2011). As a consequence, psychosomatic distress, emotional exhaustion and fatigue are very common in ER- nurses (van der Ploeg & Kleber, 2003; Potter, 2006, Escriba-Agüir & Perez-Hoyos, 2007).

Out of 45 studies on occupational stress in ER-nurses that were published during the 15 years only one had a longitudinal study design (van der Ploeg & Kleber, 2003). Cross-sectional studies have important limitations: (a) the direction of the relationship between predictors and outcomes cannot be tested, and (b) the influence of change in the work environment on outcome variables cannot be explored.

Theoretical framework

Previous studies have shown a relationship between job conditions, derived from the Job Demand Control Support (JDCS) model (Karasek & Theorell, 1990), and occupational stress outcomes in ER-nurses. In the JDCS-model psychological strain (fatigue, anxiety, depression) and ill health are seen as potential consequences of high job demands, low job control and low social support at work from supervisor and/or colleagues (Van der Doef & Maes, 1998; Van der Doef & Maes, 1999b, Häusser et al., 2010). The JDCS model has shown to explain an important part of the variance in stress-health outcomes. Inclusion of other work related variables beyond the JDCS-dimensions such as organizational

characteristics have further improved the prediction of health and well-being outcomes (McVicar, 2003; Akerboom & Maes, 2006; Adriaenssens et al, 2011, Pisanti et al., 2011).

The present study therefore includes JDCS-variables as predictors (Karasek & Theorell, 1990), as well as several organizational characteristics that are derived from the Tripod accident causation model. The Tripod accident causation model (Wagenaar et al., 1994) postulates that unsafe acts are not random events, but have their immediate origins in psychological states of mind (e.g., ways of reasoning, expectations, motives, plans, haste, emotional preoccupation). These states of mind, in turn, are generated by dysfunctional aspects of the organizational environment or latent failures (e.g. lack of work agreements such as poor information provision and unclarity of procedures, a reward system merely related to work speed, lack of personnel resources such as understaffing and poor training, lack of material resources and social harassment). These latent failures or organizational characteristics also demonstrated to have important adverse consequences in terms of stress-health outcomes (Akerboom & Maes, 2006).

Studies in ER-nurses that are based on the JDCS-model, found high work demands to be related to higher levels of fatigue and psychosomatic distress (Zangaro & Soeken, 2007; Adriaenssens et al., 2011). Lack of decision authority and skill discretion were both related to higher levels of occupational stress (McGrath et al., 2003; Adriaenssens et al. 2011). Lack of social support, by supervisor and colleagues, was found to be a strong predictor of psychosomatic distress in ER-nurses (Adriaenssens et al., 2011). Organizational variables can have an additional effect on the development of occupational stress for ER-nurses. For example, in a cross-sectional study, reward and appreciation were found to be strong predictors of job satisfaction, work engagement and lower fatigue levels, while adequate work procedures were related to more work engagement and less fatigue (Adriaenssens et al., 2011).

Until now, no longitudinal research in ER-nurses has been conducted on both job-content related factors and organizational characteristics as potential predictors of stress-health outcomes. Therefore, a longitudinal design was used in this study to investigate the main research question: to what extent do changes over time in (1) job characteristics (job demand, control and social support) and (2) organizational factors (social harassment, work agreements, material resources, personnel resources and reward) predict distress outcomes (job satisfaction, work engagement, emotional exhaustion, turnover intention and psychosomatic distress) at follow-up.

2. THE STUDY

Methods

Design & participants

This study uses a complete two wave panel design. With this approach all independent and dependent study variables are measured on both time points. The advantage of a complete panel design compared

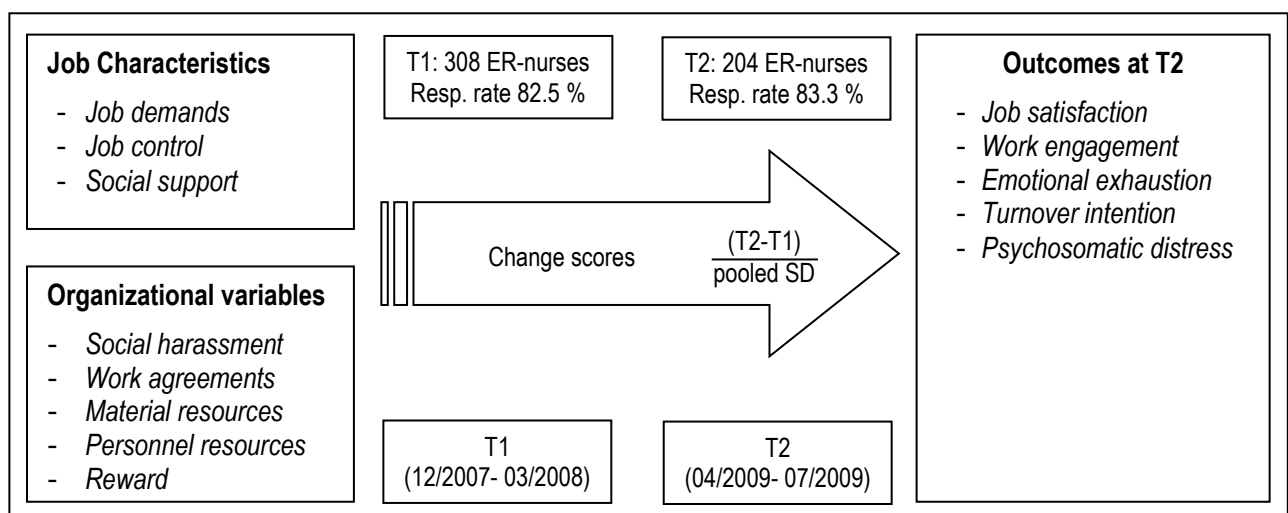
over incomplete panel designs (in which not all study variables are measured at all time points) is that the directions of relationships can be determined, thus allowing for a better understanding of the causal process (de Lange et al., 2003). All variables were measured by means of a self-administered structured survey, from December 2007 to March 2008 (T1) and from April 2009 to July 2009 (T2). The mean interval between the first and the second assessment was 18 months, which is sufficient to allow for research on the impact of organizational changes (Zapf et al., 1996) (Figure 1). Fifteen out of 56 general non-university hospitals (Flemish Government Website) were randomly selected from all over Flanders, in order to have a representative sample that met criteria for an optimal sample size (N=297) (Raosoft Inc.® sample size calculator).

Data collection

Every potential respondent (T1, N=308; T2, N=204) received an invitational letter at T1 and T2, containing information on the study, and an informed consent form. The first author, who himself is an emergency nurse, informed the potential respondents about the study during staff meetings. The head nurse distributed the paper questionnaires to the ER-nurses. Each respondent was asked to fill in the questionnaire individually in his/her leisure time. One reminder was sent one month after the start of data collection. The completed questionnaires were returned in a sealed mailbox in the emergency department. The mailboxes were collected by the first author two months after the distribution of the questionnaires.

At T1, 308 nurses, working at least for one month in the emergency department, and having direct patient contact, were approached. Supervisors and nursing managers were excluded from the study. A total of 254 completed questionnaires was returned at time 1 (response rate 82.5 %). Of this sample, 204 nurses, still working 18 months later at the same ER, were eligible for the survey. This decrease in number of eligible subjects from T1 to T2 implies a turnover rate of 19.7 % (range 5 % to 36 %) in a period of 18 months. A total of 170 completed questionnaires was returned (response rate 83.3 %). These respondents were included in the present study.

Figure 1: Design of the study



Measures

Socio-demographics

Data were gathered at T1 and T2 on the socio-demographic status of each respondent, including age, gender, marital status, level of education, degree, years of service, number of working hours and shift work schedule. All other measures, used to assess predictors and outcomes, are described in table 1.

Quality of work: job characteristics and organizational variables

In this study, the Leiden Quality of Work Questionnaire for Nurses (LQWQ-N) (Gelsema et al., 2005) was used at T1 and T2. The LQWQ-N consists of 15 subscales measuring six job characteristics, seven organizational characteristics and two outcome variables ('job satisfaction and 'turnover intention'. The subscales and example items can be found in table 1. For the purpose of this study and in accordance with the LQWQ-N guidelines, the sum-score for the dimensions 'work/time demands' and 'physical demands' was used as a measure of Job Demands. The sum score of the dimensions 'skill discretion' and 'decision authority' was used as a measure of Job Control. The sum score for 'social support supervisor' and 'colleagues' was used as a global measure of social support. Because of low Cronbach's α -scores, the dimensions of two organizational variables, internal communication and nurse-doctor collaboration, were excluded from further analysis.

The validated LQWQ-N was derived from the Leiden Quality of Work Questionnaire (LQWQ) (Van der Doef & Maes, 1999a). The items of the LQWQ-N are occupation-specific. The factor structure of the LQWQ-N was determined by means of factor analyses and reliability analyses and was established in previous studies (Gelsema et al., 2005; Pisanti et al., 2011; Adriaenssens et al. 2011). All items are formulated as statements which have to be rated on a 4-point Likert scale, ranging from 1 (totally disagree) to 4 (totally agree). A higher score on a LQWQ-N subscale, except for 'turnover intention', indicates a more favorable situation for the respondent in his workplace. The subscales are described below.

Outcome Variables:

Stress-health outcomes were operationalized in terms of 'job satisfaction', 'turnover intention' 'work engagement', 'emotional exhaustion', and 'psychosomatic distress'.

Job Satisfaction was assessed by means of the LQWQ-N. This dimension of the instrument measures the extent to which nurses are satisfied with their job. A higher score on this variable points at a higher level of job satisfaction.

Turnover intention was also assessed by means of the LQWQ-N. This dimension of the instrument measures the extent to which nurses have the intention to leave their current workplace or the job. A higher score on this variable indicates a higher intention of changing from workplace.

Table 1: Description of the measures and their dimensions and subscales.

Dimension and subscales	Scale	N° of items	Cronbach's α		Item description and example
			T1	T2	
Work characteristics					
Work/Time demands	LQWQ-N	5	.75	.76	Work and time pressure: "During my shift, I am responsible for the care of too many patients."
Physical demands	LQWQ-N	4	.75	.74	Physical burden of work: "In carrying out my work, I must often lift or move large and/or heavy objects."
Job demands	LQWQ-N	9	.75	.73	Sum score of Work/Time demands and Physical Demands
Skill discretion	LQWQ-N	4	.79	.82	Task variety and the extent to which the job challenges one's skills: "My job gives me the opportunity to develop my abilities."
Decision authority	LQWQ-N	4	.70	.73	Extent to which nurses have the freedom to act on what they know and the amount of freedom they have over their work conditions: "I have the opportunity to make my own decisions at work."
Job Control	LQWQ-N	8	.74	.82	Sum score of 'skill discretion' and 'decision authority'
Social Support supervisor	LQWQ-N	4	.92	.93	Support provided by the supervisor: "I feel appreciated by my supervisor."
Social support colleagues	LQWQ-N	4	.82	.83	Instrumental and emotional support provided by colleagues: "My colleagues give me emotional support when I'm having difficulties."
Social Support	LQWQ-N	8	.87	.87	Sum score of 'social support supervisor' and 'social support colleagues'
Organizational variables					
Work Agreements	LQWQ-N	4	.78	.79	Quality and feasibility of procedures: "In my department, procedures and rules are often unclear."
Material Resources	LQWQ-N	3	.67	.77	Availability and quality of materials and instruments on a particular ward: "Materials, equipment and/or instruments are not always available when necessary."
Personnel Resources	LQWQ-N	4	.68	.68	Amount and quality of personnel on a particular ward: "In my department, there are enough nurses to provide good care."
Internal Communication ⁽¹⁾	LQWQ-N	5	.59	.59	Quality of information provision in the organization: "In this organization, one must ask a question repeatedly before getting an answer."
Nurse-Dr. collaboration ⁽¹⁾	LQWQ-N	4	.57	.56	Jointly sharing information between nurses and doctors for decision making and problem solving: "In my department, nurses and doctors work well together."
Rewards	LQWQ-N	6	.69	.71	Rewards in terms of bonuses or appreciation: "In this organization there are insufficient funds and/or facilities for nurses."
Social Harassment	LQWQ-N	4	.88	.86	Use of peer rejection or exclusion to humiliate or isolate a person: "Some staff members in my department are excluded."
Outcome variables					
Job Satisfaction	LQWQ-N	3	.74	.68	The extent to which nurses are satisfied with their job: "If I had the choice now, I would take this job again".
Turnover intention	LQWQ-N	3	.77	.81	The extent to which nurses have the intention to leave their current workplace or the job: "I'm thinking about working in another hospital".
Vigor	UWES	3	.81	.85	Level of energy and mental resilience while Working: "At my work, I feel that I am bursting with energy"
Dedication	UWES	3	.86	.89	Level of involvement in one's work, and experience of a sense of significance and enthusiasm: "I am enthusiastic about my job"
Absorption	UWES	3	.82	.86	Level of concentration and being happily engrossed in one's work: "I am immersed in my work"
Work Engagement	UWES	9	.93	.95	Sum score of the UWES-subscales 'vigor', 'dedication' and 'absorption'.
Emotional Exhaustion	MBI	9	.90	.86	Chronic state of physical and emotional depletion resulting from excessive job demands: "I feel tired when I get up in the morning and have to face another day on the job"
Anxiety	BSI	6	.77	.76	Level of unpleasant feelings of apprehensiveness: "suddenly scared for no reason"
Depression	BSI	6	.81	.82	A state of mind with persistent low mood, absence of positive affect, and a range of associated emotional, cognitive, and behavioral symptoms.: "feeling blue"
Somatisation	BSI	7	.76	.73	Level of experiencing and communicate psychological distress in the form of physical symptoms: "pains in the heart or chest"
Psychosomatic distress	BSI	19	.87	.86	Sum score of BSI-subscales 'anxiety', 'depression' and 'somatisation'

Scales: LQWQ-N: 1 (totally disagree) to 4 (totally agree); UWES and MBI: 0 (Never) to 6 (Always); BSI: 0 (not at all) to 4 (very much). ⁽¹⁾ Due to low Cronbach's alpha, this dimension was excluded for further analysis.

Work Engagement was assessed by means of the Utrecht Work Engagement Scale (UWES) (Schaufeli & Bakker, 2004). The UWES was found to have adequate consistency, reliability and validity (Seppälä et al. 2009). The items of the UWES are grouped into three subscales: vigor, dedication and absorption. All items are scored on a 7-point rating scale, ranging from 0 (never) to 6 (daily). Because of high intercorrelations between the subscales in the present study, only the total score was used. Higher scores are indicative of a higher work engagement.

Emotional Exhaustion, which reflects the main dimension of occupational burnout (Lee & Ashforth, 1996; Maslach & Jackson, 1997; Maslach, 1998), was measured by means of the Dutch version of the Maslach Burnout Inventory (MBI). The MBI consists of three dimensions (Emotional Exhaustion, Depersonalization and Lack of Personal Accomplishment) and has adequate internal consistency, reliability and validity (Bakker et al., 2002). Items are scored on a 7-point likert scale, ranging from 0 (Never) to 6 (Always). For the purpose of the present study, only the Emotional Exhaustion dimension was used. Higher scores point at higher levels of Emotional Exhaustion.

Psychosomatic distress: this variable was a sum score of the subscales 'anxiety', 'depression' and 'somatisation', of the validated Dutch version of the Brief Symptom Inventory (BSI). The BSI has been found to have adequate consistency, reliability and validity and is considered to be a good and shorter alternative for the Symptom-Checklist-90-revised (SCL-90R) (Derogatis, 1993; De Beurs & Zitman, 2005). Items are scored on a 5-point likert scale ranging from 0 (not at all) to 4 (very much). A higher score on a BSI-subscale indicates a higher level of the specific complaint.

Ethical considerations

At T1, all eligible subjects received an invitational letter, containing information on the study and an informed consent letter. To ensure confidentiality, an identification code was used on the questionnaires. Only one of the researchers had access to the identification code list. Signed informed consent forms were obtained from the participants before data collection at both measurements. Participation at T1 and T2 was on a voluntary basis. Appropriate institutional board approval was obtained for this study.

Data analysis

The Statistical Package for the Social Sciences for Windows 20.0 (SPSS[®] Inc., Chicago, IL, USA), was used to analyze the data. Descriptive statistics (means, standard deviations, frequency distributions, skewness and kurtosis) were computed. Pearson correlations were calculated between predictors and outcomes for T1 and T2. A standardized change score was calculated by use of Cohen's Delta (difference between T2 and T1, divided by the pooled standard deviation) (Cohen, 1988). Multiple linear regression analyses were conducted using the enter-method to examine the longitudinal effect (by means of change scores) of exposure to job characteristics, and organizational variables on the one hand and the outcome variables job satisfaction, turnover intention, work engagement, psychosomatic distress and emotional

exhaustion at T2 on the other hand, controlling for socio-demographic variables and for the respective outcome at T1. As eleven predictors were entered in the regression analysis, at least a sample of 110 ER-nurses was required from a power perspective, since the general rule is that at least 10 respondents are needed per predictor for a sample size above 100 respondents (Peduzzi et al., 1996; Wilson & Morgan, 2007).

3. RESULTS

Description of the socio-demographic characteristics of the respondents

At T2, 57.4 % of the 170 respondents were female. The mean age was 39.64 years (SD 8.57). Almost 75 % was married or co-habiting. More than 85 % had earned a bachelor degree and 82% were holders of the specialty “Certified emergency nurse” (CEN). 87.6 % of the ER-nurses worked rotating shifts, including night shifts and 54.3% worked full time. The mean job experience as a nurse was 16.26 years (SD 8.83) and the mean job experience as an ER-nurse was 13.57 years (SD 7.64). Female gender was related to higher job satisfaction ($p=.03$), higher work engagement ($p=.004$) and lower emotional exhaustion ($p=.04$). Age was positively but weakly correlated to turnover intention ($r=.24$, $p<.001$) and negatively but weakly to work engagement ($r=-.22$, $p<.01$). Marital status, educational level, degree, number of working hours and shift work were not significantly related to any of the outcome variables. Therefore these variables were not included in multiple regression analyses.

Table 2: Changes over time in job characteristics, organizational variables and outcomes (N=170).

	<i>Worsening</i> <i>Negative change ≥ 0.5 SD</i>	<i>Stable</i> <i>Change < 0.5 SD</i>	<i>Improvement</i> <i>Positive change ≥ 0.5 SD</i>
Job characteristics			
Job demands	20.5 %	61.3 %	18.2 %
Job control	24.0 %	46.4 %	29.6 %
Social Support	36.7 %	33.6 %	29.7 %
Organizational variables			
Social Harassment	25.0 %	46.8 %	28.2 %
Work Agreements	26.6 %	51.1 %	22.3 %
Material resources	30.5 %	31.2 %	38.3 %
Personnel resources	21.9 %	49.9 %	28.2 %
reward	22.7 %	52.2 %	25.1 %
Outcome variables			
Job satisfaction	28.1 %	43.7 %	28.2 %
Turnover Intention	39.5 %	36.3 %	24.2 %
Work Engagement	27.1 %	52.0 %	20.9 %
Psychosomatic distress	20.2 %	54.2 %	25.6 %
Emotional exhaustion	27.3 %	41.4 %	31.3%

Changes over time in job characteristics, organizational variables and outcomes

Descriptive analysis of the change scores (table 2) for the independent and dependent variables showed considerable changes between T1 and T2 for the different predictors. Depending on the specific predictor 18 % to 38 % of the respondents had a positive change score of more than 0.5 SD (improvement) while 20 % to 37 % had a negative change score of more than 0.5 SD (worsening). For the outcome variables, using the same criteria, 21 % to 31 % of the respondents had a positive change score, while 20% to 40% had a negative change score. Overall, job demands was the most stable characteristic as this dimension remained stable over time in 61% of the sample. In contrast social support, material resources and turnover intention showed the most variation over time, both in a negative and positive direction. The other dimensions still showed considerable variation, with on average half of the population remaining stable and the other half changing in a positive or negative direction.

Relationships between predictors and outcomes

The correlations between predictors and outcomes at T1 with their corresponding values at T2 are reported in table 3 and the results of the multiple linear regression analyses are reported in Table 4. Correlations between the independent variables were all lower than .60, indicating there was no risk of multicollinearity (Field, 2000). The JDCS-variables job demands, job control and social support at T1 on the one hand, and the organizational variables work agreements, material resources, personnel resources and reward at T1 on the other hand were significantly related to multiple outcome variables at T2.

Table 3 : Correlations between job characteristics, organizational variables and outcomes at T1 and T2 (N=170).

T2 ↓	T1 →	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. age		1.00**	-.10	-.05	-.13	-.08	.13	.16	.04	.14	-.05	.26**	-.16	-.05	.09
2. job demands		-.10	.51**	.08	.04	-.09	.04	-.08	.31**	.06	.05	-.04	.14	-.31**	-.28**
3. job control		-.02	.25**	.49**	.16	.05	.18*	.18*	.11	.18*	.37**	.26**	.29**	-.20*	-.20*
4. social support		-.06	.19*	.27**	.46**	.11	.27**	.22*	.23*	.21*	.29**	.17	.17	-.25**	-.19*
5. social harassment		-.01	.14	.13	.12	.20*	.13	.01	.14	.09	.29**	.33**	.17	-.23**	-.28**
6. work agreements		.01	.11	.07	.09	.15	.36**	.10	.23**	.19*	.10	.09	-.02	-.06	-.11
7. material resources		.24**	.02	.05	-.14	.03	.10	.31**	.06	.22*	-.05	.19*	.19*	.04	.10
8. personnel resources		.19*	.28**	.09	-.01	-.03	.05	.08	.45**	.15	.20*	.15	-.01	-.20*	.02
9. rewards		.14	.06	.23**	.26**	.13	.27**	.26**	.16	.47**	.38**	.34**	.24**	-.28**	-.23**
10. job satisfaction		.02	.21*	.33**	.16	.04	.36**	.35**	.24**	.34**	.53**	.43**	.33**	-.31**	-.30**
11. turnover intention		.24**	.04	.29**	.00	.13	.05	.22*	.15	.08	.26**	.49**	.05	-.22*	-.09
12. work engagement		-.22*	.10	.39**	.28**	.15	.18*	.27**	.08	.19*	.47**	.15	.64**	-.29**	-.48**
13. psychosomatic distress		.06	-.24**	-.17	-.19*	-.08	-.21*	-.09	-.23**	-.16	-.27**	-.13	-.41**	.59**	.54**
14. emotional Exhaustion		.07	-.30**	-.27**	-.14	-.04	-.31**	-.25**	-.25**	-.37**	-.39**	-.16	-.45**	.51**	.52**

* $p < .05$, ** $p < .01$ T1 = baseline, T2 = follow-up

Table 4: Summary of regression analyses predicting outcomes at T2 on the basis of changes over time in job characteristics and organizational variables.

	Job Satisfaction T2			Work Engagement T2			Emotional Exhaustion T2			Turnover Intention T2			Psychosomatic Distress T2		
	B	SE	β	B	SE	β	B	SE	β	B	SE	β	B	SE	β
Socio-demographics															
gender (Male=1 / Female = 2)	0.28	0.22	0.09	0.23	0.15	0.10	-0.24	0.15	-0.12	-0.32	0.31	-0.08	-0.56	0.92	-0.04
age	0.01	0.01	0.05	-0.01	0.01	-0.10	0.01	0.01	0.05	-0.03	0.02	-0.14	0.08	0.05	0.11
outcome at T1	0.57	0.07	0.56 ***	0.77	0.08	0.69 ***	0.50	0.08	0.51 ***	0.49	0.08	0.50 ***	0.55	0.07	0.57 ***
Job Characteristics															
Δ job demands	0.12	0.05	0.18 *	0.01	0.03	0.01	-0.05	0.03	-0.17*	-0.07	0.07	-0.09	-0.14	0.21	-0.05
Δ job control	0.13	0.04	0.25 ***	0.08	0.03	0.21 **	0.01	0.03	0.01	-0.08	0.06	-0.13	-0.05	0.17	-0.02
Δ social support	0.9	0.03	0.22 **	0.04	0.02	0.14	-0.07	0.02	-0.24 **	-0.07	0.05	-0.14	-0.11	0.14	-0.06
Organizational Variables															
Δ social harassment	0.04	0.04	0.07	0.01	0.03	0.01	-0.05	0.03	-0.14 *	0.01	0.05	0.01	-0.37	0.17	-0.17**
Δ work agreements	0.01	0.05	0.01	0.04	0.04	0.08	0.01	0.04	0.03	-0.17	0.07	-0.22 *	0.33	0.22	0.12
Δ material resources	-0.06	0.06	-0.06	-0.03	0.04	-0.04	-0.01	0.04	-0.02	0.14	0.08	0.14	-0.58	0.26	-0.17 *
Δ personnel resources	-0.01	0.05	-0.01	-0.01	0.04	-0.01	-0.01	0.04	-0.01	0.06	0.07	0.07	0.43	0.23	0.15
Δ reward	0.04	0.04	0.06	0.6	0.03	0.14*	0.05	0.03	0.13	-0.08	0.06	-0.11	-0.14	0.18	-0.06
	R ² model	0.50		R ² model	0.56		R ² model	0.39		R ² model	0.37		R ² model	0.44	
	adjust. R ²	0.45 ***		adjust. R ²	0.51 ***		adjust. R ²	0.33 ***		adjust. R ²	0.31 ***		adjust. R ²	0.39 ***	

Results of multiple linear regression analyses (enter-method) for the outcomes job satisfaction, work engagement, emotional exhaustion, turnover intention and psychosomatic distress at T2, controlled for the respective outcome at T1, with change scores in job characteristics and organizational variables as predictors. Abbreviations: B = unstandardized regression coefficient, SE = standard error, β = beta, Δ = change score (T2 – T1/pooled SD), adjust R² = adjusted R² model

With respect to the outcome variable *job satisfaction at T2*, socio-demographics (gender and age) were not significantly related to this variable. Job satisfaction at T1 was a strong predictor of job satisfaction at T2. Changes over time in the JDCS characteristics significantly explained additional variance in this outcome. More specifically, a more positive perception of job demands ($\beta=0.18$, $p<.05$), higher perceived job control ($\beta = 0.25$, $p<.001$) and social support ($\beta = 0.22$, $p<.01$) over time were associated with an increase in job satisfaction at T2. A change in the organizational variables did not contribute to the explanation of the outcome. The model, including all variables, explained 45% of the variance in job satisfaction.

Work engagement at T2 was not significantly related to socio-demographics. Work engagement at T1 was a strong predictor of work engagement at T2. Of the JDCS variables, only higher perceived job control over time was related to more work engagement at T2 ($\beta = 0.21$, $p<.01$). Regarding the organizational variables, a more positive perception over time of reward was associated with an increase in work engagement at T2 ($\beta = 0.14$, $p<.05$). The model, consisting of all variables, explained 51 % of the variance in work engagement at T2.

Regarding *emotional exhaustion at T2*, no significant relationship was found with socio-demographics. Emotional exhaustion at T1 was a strong predictor for emotional exhaustion at T2. With respect to the JDCS characteristics, a more positive perception of job demands ($\beta = -0.17$, $p<.05$) and social support ($\beta = -0.24$, $p<.01$) over time were related to lower levels of emotional exhaustion at T2. Regarding the organizational variables, more positive perceptions over time regarding social harassment was associated with a decrease in emotional exhaustion at T2 ($\beta = -0.14$, $p<.05$). The final model explained 33% of the variance for this outcome variable.

Turnover intention at T2 was not significantly related to socio-demographics. Turnover intention at T1 was a strong predictor for this outcome at T2. None of the JDCS-characteristics significantly contributed to the regression model. Of the organizational variables, only a positive change over time in work agreements was related to a decrease in turnover intention at T2 ($\beta = -0.22$, $p<.05$). The final model explained 31 % of the variance for this variable.

With respect to *psychosomatic distress at T2*, no significant relationship with socio-demographics was found. Distress at T1 was strongly related with distress at T2. The change scores for the JDCS-characteristics did not significantly contribute to the outcome. Concerning change scores for the organizational variables, more positive perceptions over time regarding social harassment ($\beta = -0.17$, $p<.01$) and material resources ($\beta = -0.17$, $p<.05$), were associated with a decrease in psychosomatic distress at T2. The final model explained 39 % of the variance for psychosomatic distress at T2

4. DISCUSSION

This study is unique from previous studies on occupational stress in emergency nurses because of the longitudinal design. The study showed that almost 20% of the respondents at baseline had left their workplace 18 months later. For the ER-departments in this study, this represented a loss of human capital. Previous studies show similar results: The Texas Hospital Nurse Staffing Survey 2004 found yearly turnover rates in ER-departments of 17.1% in 2004 and 22.2% in 2006 (Kishi et al., 2006), while Gillespie states that over half of the emergency departments in the United States had yearly turnover rates of more than 20% (Gillespie, 2008). In addition, there was substantial variance in turnover in the 15 participating ER-departments of our sample, ranging from 5 % to 36 %. The highest turnover rates were seen in two hospitals that were in the middle of a reorganization and fusion process and in two hospitals with a recent change of the direct supervisor after a period of internal conflicts. Turnover remains however an important issue for ER-departments.

A second finding of this study is the fact that major changes over time can be seen in the different predictors, as well as in the outcome variables. As described in the result section, depending on the specific variable, 39 to 69 % of the respondents had a substantial worsening or improvement of a job related condition in a period of 18 months. This is also the case for the outcome variables, where a change in 46 to 64% of the respondents can be observed. While job demands seems to be the most stable dimension, all other job characteristics as well as organizational variables show at least as much change as stability over time, both in a negative and a positive way. This implies that important work conditions change considerably within a relatively short time frame, which provides an opportunity for interventions to improve the work situation of the ER-nurse.

This finding is in contrast with previous research suggesting that work environment stays rather stable over time (Dormann & Zapf, 2001, Mansell et al., 2006). This is at least partly, in our opinion, due to the fact that previous studies did not use occupation-specific measures to assess job- and organizational characteristics, in contrast with the present study.

With regard to our main research question, changes over time in job characteristics (JDCS: Job demands, control and social support) were significantly related to job satisfaction, work engagement and emotional exhaustion, but not to turnover intention and psychosomatic distress at T2. In general, these findings are also consistent with the Job Demands-Resources model that distinguishes between two important processes that are differently related to stress-health outcomes: a motivational process that is based on available resources such as control, social support and reward and an energy depletion process leading to fatigue and distress that is caused by high demands (Bakker et al., 2005). The model states that work overload and high emotional demands may deplete employees' resources and lead to a state of (emotional) exhaustion, while autonomy (job control) and reward are seen as job resources which

instigate a motivational process leading to work engagement and organizational commitment. These effects were also found in the present study.

Due to the lack of longitudinal research in ER-nurses, it is difficult to compare the results of this study with the findings of previous studies. One longitudinal study reported ambulance nurses to have higher exposure to acute and chronic occupational stressors than a general nurses reference group (van der Ploeg & Kleber, 2003). Especially lack of social support/team spirit and poor communication at T1 were found to be strong predictors of well-being at work at follow up. A longitudinal study in ambulance workers (EMT) also found a significant effect of social support and time pressure at baseline on job satisfaction and emotional exhaustion at follow-up (Sterud et al., 2011). These results are consistent with the present study that found changes over time in social support and job demands to be predictive of job satisfaction and emotional exhaustion. Van der Ploeg et al (2003) emphasized the importance of good interpersonal relationships and therefore recommended workplace interventions to improve group cohesion and communication on the work field to prevent adverse consequences.

The results of this study are also consistent with a longitudinal study in a general nurse population that identified job demands, job control and social support as predictors of job satisfaction (Jönsson 2012). Another longitudinal study in a general nurse population found a significant relationship between job demands and emotional exhaustion (Sundin et al., 2012). A follow-up study by Gelsema et al. revealed a significant relationship between social support and job control on the one hand and job satisfaction on the other hand and also found an effect over time of job demands on emotional exhaustion (Gelsema et al., 2006).

The fact that no direct relationship was found between JDCS-variables and turnover intention or psychosomatic distress may be explained by the fact that these outcomes are longer term outcomes that are influenced by more short term outcomes such as job satisfaction and work engagement. Short term outcomes are directly influenced by the JDCS-variables, while longer term outcome variables require more time and are influenced or mediated by these short term variables. Several studies mentioned the mediating role of job satisfaction and engagement on turnover intention (Meeusen et al., 2011; Peterson et al., 2011; Sawatzsky & Enns, 2012). A systematic review on turnover intention in general nurses found job satisfaction and commitment (work engagement) to be stronger predictors of turnover than career opportunities elsewhere (Hayes et al., 2012). In addition, psychosomatic distress is a rather general outcome which is not only influenced by occupational factors. A longitudinal study by Gelsema et al. showed that psychological distress and somatic complaints in a general nurse population can also be influenced by variables outside the work environment (Gelsema et al, 2006).

To our knowledge, this study is the first longitudinal research in ER-nurses that includes JDCS-variables and organizational variables. The second part of the main research question regarded the influence of changes in these organizational variables over time. Changes over time in work agreements, material

resources, personnel resources, reward and social harassment were not related to job satisfaction and showed only small effects on work engagement, emotional exhaustion and turnover intention. These findings are different from the results of a cross-sectional study, where organizational variables accounted for a significant additional part of the explained variance (Adriaenssens et al., 2011). One of the reasons for this finding is that changes in JDCS-variables accounted for a large part of variance in job satisfaction, work engagement and emotional exhaustion at T2. Only changes in reward were found to influence work engagement at T2, decreased social harassment overtime was related to a decrease in emotional exhaustion and psychosomatic distress at T2, while a positive change in work agreements was related to a decrease in turnover intention.

The effect of social harassment on emotional exhaustion and psychosomatic distress in this longitudinal study supports previous research that found strong relationships between social harassment and burnout (Laschinger & Grau, 2012). As a consequence, timely detection of social harassment is very important and the introduction of anti-bullying policies and codes of conduct to prevent, detect and stop social harassment in a team is a well justified priority (Vartia & Leka, 2011). The relationship between reward and work engagement is also consistent with the Job Demands Resources model (Bakker, Demerouti & Euwema, 2005) that defines reward as a job resource. This study showed a need for well-balanced commitment-related reward systems, with emphasis on appreciation for above-average efforts or achievements. Rewards do not necessarily have to be only financial. Recognition, respect, responsibility, appreciation, personal attention and opportunities for growth are at least equally important (Curran, 2004; Berger & Berger, 2008). There has to be an equitable balance between the employee's personal contribution to the organization and the organization's contribution to the employee's personal goals and well-being.

The results of this study especially point at the importance of a good fit between the employees and their work environment, in terms of job demands, job control and social support. The findings also indicate that there are opportunities, within a relatively short time frame, to intervene in these predictors in order to improve relevant outcomes for ER-nurses. Interventions should be targeted at deteriorations in specific predictors. No doubt, it is important to fulfill vacancies as soon as possible, to ensure an adequate work load and priority, to anticipate peak load and to increase work efficiency wherever possible. Due to the current shortage of nurses, it is however difficult to find new employees. Therefore, management has to invest actively in the preservation of its human capital. A study by Sawatsky and Enns (2012) showed that engagement was an important buffer between job characteristics and the intention to leave the emergency nursing profession. Engagement was found to be influenced by type of leadership, opportunities for professional development, collaboration with physicians, staffing issues and shift work. Therefore, a good retention plan for ER-nurses should include investment in collaborative and empathic leadership of supervisors (by means of selection and training), creation of a

supportive work climate and opportunities for professional growth for ER-nurses (individual development plans, career plans). Furthermore it is important to create a good interdisciplinary group cohesion with mutual recognition, and flexible shift-scheduling with a focus on a good work-home balance.

In the case of lack of job control, management should ensure bottom-up communication and regular work meetings in order to create self-managing teams that guarantee employee involvement and participation. In addition, where possible, a tolerant attitude towards individual and group variance in work procedures is important. Direct supervisors must be available for their personnel, organize frequent team meetings, and be able to provide adequate personal feedback, related to performance and attitudes of ER-nurses. In addition, a strong group spirit is very important in emergency care as colleagues are an important buffer against consequences of confrontations with traumatic work situations (Maes & Van der Doef, 2004; Sawatzsky & Enns, 2012).

Finally, due to the variance of predictors and outcomes over time, this study underpins the importance of surveying nursing wards, such as ER-departments, regularly, e.g. at least every two years, on job and organizational characteristics, short term and longer term outcomes in order to prevent adverse consequences in terms of job satisfaction, work engagement, psychosomatic distress, burnout, absenteeism and turnover (intention) and to define intervention targets and action plans for the next years. There are several instruments that can be used by a human resources department to perform surveys at institutional and unit level, such as the Leiden Quality of Work Questionnaire for Nurses (LQWQ-N) or the Questionnaire on the Experience and Assessment of Work (QEAW). In addition direct supervisors should be trained in individual performance reviews that include the personal experience of emergency health care providers related to important job and organizational characteristics.

Strengths and weaknesses

The high response rate (both at baseline and at follow-up), the theoretical framework and the relatively large sample of ER-nurses, in comparison to other studies, are important strengths of this study. The broad variety of measured potential stressors, consisting of JDCS variables and organizational factors, is also an important strength of this study. A limitation is that there is only one follow-up measurement point. It would certainly be interesting to follow ER-professionals over a longer period of time. Secondly, institutional variables, such as size and location (rural, urban) of the ER-department, were not measured, mainly because all departments were located in smaller cities in a densely populated country and did therefore not substantially differ in this respect. However, future research should include such predictors. Next, the study was conducted in one country and results may be influenced by the specific work and cultural context. Cross-national studies are important to understand the influence of contextual and cultural factors on predictors and outcomes. Finally, although the high turnover rates are a characteristic of the study population and could thus not be prevented, they may limit the

generalizability of the results. Despite these limitations, the findings of this study are pioneering because they point at various important predictors, including socio-demographic and job characteristics and some organizational factors, of stress-health outcomes in ER-nurses that can be influenced by interventions.

5. IMPLICATIONS FOR NURSING MANAGEMENT

The high turnover rate in ER-nurses, found in this study, has to be a point of concern for hospital management, because of the loss of human capital and the growing nursing shortage worldwide. Additionally, this study found significant changes over time in predictors and outcomes of occupational stress in ER nurses. This provides opportunities to intervene in these predictors in order to improve work conditions and outcomes and to reduce turnover rates. On the one hand, changes in job characteristics (job demands, job control and social support) were found to predict job satisfaction, work engagement and emotional exhaustion. These short term variables may, in turn, influence longer term outcomes such as turnover intention. On the other hand, organizational variables showed only small, but significant, effects on the short term outcomes. Reward was found to be predictive of work engagement, and social harassment predicted emotional exhaustion. All of these factors can be influenced by hospital management. The findings of this study can direct managers to target work related interventions at lowering job demands, increasing job control, improving social support and team spirit, and striving for a well-balanced commitment related reward system. Moreover, this study underpins the need to invest in participative empathic leadership and personnel empowerment. Finally, this study provides arguments to regularly screen (emergency) nursing wards on job characteristics and organizational variables to prevent adverse work related outcomes. Future longitudinal studies are needed to support and refine the findings of this study.

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Chapter 5

Goal orientation is associated with work engagement and burnout in emergency nurses.

Jef Adriaenssens, Veronique De Gucht, Stan Maes

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Abstract

Objectives: Goal orientation is a mindset towards the achievement of work related goals and is found to be related to occupational well-being. This study explored to what extent the 4-dimensional model of goal orientation adds additional variance to the explanation of burnout and work engagement in emergency nurses, after controlling for demographics, job characteristics and organizational variables.

Methods: 170 out of 274 emergency nurses from 13 secondary Belgian hospitals (response rate 62%) completed self-report questionnaires including the Leiden Quality of Work Questionnaire for Nurses, the Goal Orientation Questionnaire, The Maslach Burnout Inventory and the Utrecht Work Engagement Scale. Hierarchical multiple regression analyses were conducted.

Results: Goal orientation explained 14% and 13% of the variance in burnout and work engagement respectively. Job control was predictive of both outcomes. Job demands was a predictor of burnout and social support predicted work engagement. Reward was related to work engagement. Mastery-Approach goal orientation was strongly related to an increase in work engagement and to a decrease in burnout. Performance-avoidance goal orientation was strongly related to a decrease in work engagement and to an increase in burnout. Performance-approach and mastery-avoidance goal orientation were not predictive for the two outcome variables.

Conclusions: Goal Orientation explains additional variance in burnout and work engagement over and above work characteristics and organizational variables. A mastery-approach goal orientation appears to be beneficial while a performance-avoidance goal orientation is not. Hospital management should therefore invest in personal involvement and growth of ER-nurses and in a rewarding organizational culture.

1. INTRODUCTION

A lot of studies have explored the determinants of occupational stress and burnout in emergency (ER) nurses. Among these determinants are demographic characteristics (e.g. age, gender), personality characteristics (e.g. lack of hardiness), coping strategies (e.g. avoidant behavior), repeated exposure to traumatic events, work characteristics (e.g. high job demand, low job control & low social support) and organizational factors (e.g. lack of communication, collaboration and resources, bad organizational culture) (Adriaenssens, De Gucht & Maes, 2013; Browning, Greenberg & Rolniak, 2007). Far less research has however been conducted from a more positive perspective, exploring e.g. the determinants of work engagement. While job characteristics prove to predict work engagement (Adriaenssens et al., 2013), motivational aspects are also thought to play an important role. Research has shown that low levels of intrinsic motivation are associated with lower levels of work engagement and high levels of burnout (Van Beek et al., 2012; Van den Broeck et al., 2011). It is therefore expected that intrinsic motivation will also play a beneficial role in ER-nurses. Goal orientation is an important motivational concept based upon the difference between intrinsic and extrinsic motivation and can be defined as a mindset towards the achievement of work related goals (Kalkan, Odaci & Epli Koç, 2011). To our knowledge, to date there is no research on the influence of goal orientation on occupational well-being in ER-nurses.

Theoretical framework

Main dimensions of the concept of goal orientation (Ames, 1992) are “mastery” and “performance”. *Mastery goal orientation*, points at a persons’ striving to develop skills and competencies, learn, understand and internalize information (Ames, 1992). Individuals with a mastery goal orientation tend to strive for personal development and growth, resulting in achievement related behavior and task engagement. Mastery goal orientation is associated with more resilience to increases in workload (Van Yperen & Janssen, 2002), more creativity (Janssen & Van Yperen, 2004), more effort and persistence in tasks, and more resistance to obstacles and problems, because tasks are perceived as a challenge and not as a threat. Employees with a mastery goal orientation are found to have a strong intrinsic motivation (Elliot & Harackiewicz, 1996), are known to adapt easier to change (Yeo & Neal, 2004) and they are more oriented to cooperation with peers as a necessary element for succeeding. Because failure is not a primordial concern, they perceive less stress and their performance will improve. Moreover, mastery goal orientation is related to higher self-efficacy, positive coping, and higher levels of well-being (Kaplan & Maehr, 2007).

Performance goal orientation points at a persons’ striving to demonstrate competence, i.e. focusing on the impression that others have of their abilities, attempting to create an image of high ability and avoiding activities that could damage that image (Ames, 1992). Employees with performance goal orientation have more problems with adjustment to changes at work, they feel happier with tasks they

have rehearsed extensively (Davis et al., 2005) and experience a rise in anxiety when they feel judged or evaluated. They usually are not oriented towards cooperation and seek less help and support from others (Ryan, Pintrich & Midgley, 2001). Because of their 'aversion' of sharing and collaboration they tend more to demonstrate superiority than to work towards an integration of competing values and interests (Darnon et al., 2006). Performance orientation leads to higher levels of interpersonal conflicts with peers and supervisors and to less exchange of knowledge on the work floor (Janssen & Van Yperen, 2004), because peers and supervisors are rather perceived as a threat than as a safe source of knowledge and experience.

In the late 90s of the previous century, Elliot stated that one also had to make a distinction in the performance dimension between approach and avoidance (Elliot & Church, 1997). An *approach orientation* (promotion focused) is a proactive attempt pointing at achieving success, while an *avoidance orientation* (prevention focused) is an attempt to evade a situation because of a focus on failure (Kaplan & Maehr, 2007). Elliot and colleagues proposed to define performance approach and performance avoidance as two distinct dimensions (Elliot & Church, 1997). *Performance-approach* (PAp) is defined as the desire to prove one's competence and to gain favorable judgments about it (Vandewalle, 1997). It is found to be related to persistence and positive affect but also to anxiety, disruptive behavior and low retention of knowledge (Kaplan & Maehr, 2007). *Performance-avoidance* (PAv) orientation is defined as the desire to avoid disapproval of one's competence and to avoid negative judgments about it (Vandewalle, 1997). It is found to be related to low efficacy and anxiety (Kaplan & Maehr, 2007). In recent years, researchers argued that there is enough evidence to also divide the mastery goal orientation in an approach and avoidance dimension (Baranik, Barron & Finney, 2007). *Mastery-avoidance* (MAv) was defined as 'a focus on avoiding self-referential or task-referential incompetence' (striving to avoid loss of skills, abilities and knowledge or misunderstand material), whereas *mastery-approach* (Map) entails striving to develop one's skills and abilities, advance one's learning, understand material, or master a task (Elliot, 2006). The final theoretical model, consisting of the four dimensions of goal orientation, is named 'the 2 x 2 goal orientation framework' (Baranik et al., 2007).

The definition of *job characteristics*, as used in the present study, is based on the Job Demand Control Support (JDCS) model (Karasek & Theorell, 1990). In this model psychological strain and ill health are predicted by a combination of high job demands, low job control and low social support at work from supervisor and/or colleagues. The JDCS model has shown to explain an important part of the variance in stress-health outcomes (Häusser et al., 2010).

Organizational variables used in the present study, are derived from the Tripod accident causation model (Wagenaar et al., 1994) that postulates that work related states of mind (e.g. expectations, motives, plans, haste) can be generated by dysfunctional aspects of the organizational environment or latent failures (e.g. lack of work agreements, unclarity of procedures, an imbalanced reward system, lack of

personnel resources, lack of material resources and social harassment). These organizational variables were found to be related to stress-health outcomes in ER-nurses (Adriaenssens et al., 2013).

Burnout can be defined as a psychological state of depletion of social and personal resources, resulting from prolonged emotional or psychological stress on the job. The concept has three dimensions: emotional exhaustion, depersonalization and lack of personal accomplishment (Maslach & Jackson, 1981). *Work engagement* describes the way workers experience their work and can be defined as "...a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" (Schaufeli & Bakker, 2010).

Research in nurses showed a relationship between goal orientation and occupational well-being. In a study in nurse managers, self-efficacy was positively related to mastery goal orientation and performance-approach orientation (Kalkan et al., 2011). Another study revealed that the negative impact of staff shortage, high physical demands, poor work agreements and lack of skill discretion in nurses *with a prevention focus* was bigger, than in *promotion focused* nurses (Gelsema et al., 2007).

The main research question of the present study was "To what extent does the four dimensional model of goal orientation add additional variance to the explanation of work engagement and burnout in ER-nurses after controlling for job characteristics and organizational variables?". More specifically it is hypothesized that (1) a mastery-approach goal orientation is related to higher levels of work engagement and lower levels of burnout, (2) a performance-approach goal orientation is related to lower levels of work engagement and higher levels of burnout, (3) a mastery-avoidance goal orientation is related to lower levels of work engagement and higher levels of burnout, and (4) a performance-avoidance goal orientation is related to lower levels of work engagement and higher levels of burnout.

2. THE STUDY

Study design and participants

This cross-sectional survey was conducted in the Emergency Departments of 13 Belgian general hospitals, by means of a self-administered structured questionnaire, from April 2009 to July 2009. Thirteen hospitals were at random selected from all over Flanders. Every respondent, working in these ER-Departments, received an invitational letter, with information on the study, and an informed consent form. The first author, an ER-nurse, visited every Emergency Department and provided information on the objectives and the relevance of the study. Afterwards, the head nurse distributed the paper questionnaire randomly to the ER-Nurses. Each respondent was asked to fill in the questionnaire individually in his/her leisure time. One reminder was sent one month after the start of data collection. The completed questionnaires could be deposited anonymously in a sealed mailbox in the Emergency Department. The mailboxes were collected by the first author three months after the distribution of the questionnaires. The eligible population consisted of all the ER-Nurses who had patient contact (n = 274)

and were working at least six months in an emergency care unit. Head nurses and nursing managers were excluded from the sample. A total of 170 completed questionnaires were returned (response rate 62.0 %).

Measures

Predictors

Personal characteristics

In the present study, age, gender, level of education, type of shift work (with/without night shifts) and job time (part-time/full-time) were taken into account as personal characteristics.

Job characteristics and organizational variables

The Leiden Quality of Work Questionnaire for Nurses (LQWQ-N) (Maes et al., 1999) was used to assess job characteristics as a measure for quality of work. The LQWQ-N consists of 15 subscales measuring job characteristics (6 dimensions), organizational variables (7 dimensions), and two outcome variables ('job satisfaction' and 'turnover intention'). The items of the LQWQ-N are occupation-specific. The development of the LQWQ-N was partly based on the Job Content Questionnaire (JCQ) (Maes et al., 1999; Van der Doef & Maes, 1999). The JCDS concepts are thus measured in a similar way. The factor structure of the LQWQ-N was determined by means of factor analyses and reliability analyses. All items are formulated as statements which have to be rated on a 4-point Likert scale, ranging from 'totally disagree' to 'totally agree'. For the purpose of this study, the subscales described below were used. For each scale the Cronbach's- α for this sample is given, as well as the number of items.

Work characteristics: *Work and Time Demands* ($\alpha = .76$; 5 items): work pressure and time pressure; *Physical Demands* ($\alpha = .74$; 4 items): physical burden of work; *Skill Discretion* ($\alpha = .82$; 4 items): task variety and the extent to which the job challenges one's skills; *Decision Authority* ($\alpha = .73$; 4 items): extent to which nurses have the freedom to act on what they know and the amount of decision authority they have over their work conditions; *Social Support Supervisor* ($\alpha = .93$; 4 items): support provided by the supervisor, and *Social Support Colleagues* ($\alpha = .83$; 4 items): support provided by colleagues. For the purpose of this study and in accordance with the LQWQ-N guidelines, the sum-score for the dimensions 'work/time demands' and 'physical demands' was used as a measure of Job Demands ($\alpha = .73$; 9 items). The sum score of the dimensions 'skill discretion' and 'decision authority' was used as a measure of Job Control ($\alpha = .82$; 8 items). The sum score for 'social support supervisor' and 'colleagues' was used as a global measure of Social Support ($\alpha = .87$; 8 items).

Organizational variables: *Nurse-Doctor Collaboration* ($\alpha = .56$; 4 items): Jointly sharing information for decision making and problem solving. *Rewards* ($\alpha = .71$; 6 items): rewards in terms of bonuses or

appreciation. *Personnel Resources* ($\alpha = .68$; 4 items): amount and quality of personnel on a particular ward. *Material Resources* ($\alpha = .77$; 3 items): availability and quality of materials and instruments on a particular ward. *Work agreements* ($\alpha = .79$; 4 items): quality and feasibility of procedures. *Internal communication* ($\alpha = .59$; 5 items): communication between departments, information provision. *Social harassment* ($\alpha = .86$; 4 items): Use of peer rejection or exclusion to humiliate or isolate a person. Because of the low Cronbach α -score, the dimensions internal communication, nurse-doctor collaboration and personal resources were excluded from further analysis.

Goal orientation

This study used the Dutch version of an 18-item measure for the assessment of the four-factor structure of goal orientation, based on research by Vandewalle (1997) and Baranik, Barron, and Finney (2007). The scale was found to be reliable and valid in previous research (2007). An exploratory factor analysis was conducted using principal components analysis with varimax rotation (eigen value ≥ 1). This analysis revealed a four-factor solution, which accounted for 54.2% of the total variance. Two items did not load sufficiently on the correct factor and were therefore omitted. The final instrument used for the present study consisted of 4 subscales: *Mastery-Avoidance* (MAv) ($\alpha = .71$; 5 items): focus on avoiding self-referential or task-referential incompetence; *Mastery-Approach* (MAp) ($\alpha = .69$; 3 items): striving to develop one's skills and abilities, advance one's learning, understand material, or master a task; *Performance-Approach* (PAp) ($\alpha = .75$; 4 items): the desire to prove one's competence and to gain favorable judgments about it, and *Performance-Avoidance* (PAv) ($\alpha = .72$; 4 items): the desire to avoid disapproval of one's competence and to avoid negative judgments about it. All items are formulated as statements which have to be rated on a 6-point Likert scale, ranging from 'strongly agree' to 'strongly disagree'.

Outcome variables

Burnout was assessed by means of the 20-item Dutch version of the Maslach Burnout Inventory for Human Services Survey (MBI-HSS) (Schaufeli & Van Dierendonck, 1994). The MBI-HSS consists of three dimensions: Emotional Exhaustion (EE) ($\alpha = .85$; 8 items), depersonalization (DP) ($\alpha = .71$; 5 items), and lack of personal accomplishment (PA) ($\alpha = .80$; 7 items). Items are scored on a 7-point likert scale, ranging from 0 (Never) to 6 (Always). A total score for burnout was calculated by use of a weighted sum score of the three dimensions ($0.4 \times EE + 0.3 \times DP + 0.3 \times \text{inversed-PA}$) (Ahola et al., 2009). For the purpose of this study, only the sum score was used as a global measure of burnout ($\alpha = .72$; 20 items). A high score is indicative of burnout. The MBI-HSS was found to have adequate internal consistency, reliability and validity (Vanheule, Rosseel & Vlerick, 2007).

Work engagement was assessed by means of the short version of the Utrecht Work Engagement Scale (UWES) (Schaufeli & Bakker, 2004). The items of the UWES are grouped into three subscales: Vigor ($\alpha = .88$; 3 items); Dedication ($\alpha = .88$; 3 items), and absorption ($\alpha = .86$; 3 items). A total score for work engagement was calculated by use of the sum score of the subscales ($\alpha = .95$; 9 items). For the purpose of this study, only the sum score was used as a measure of work engagement. All items were scored on a 7-point rating scale, ranging from 0 (never) to 6 (daily). A higher score is indicative of a higher work engagement. The UWES was found to have adequate consistency, reliability and validity (Seppälä et al. 2009)¹.

Ethical considerations

Every potential respondent received an invitational letter, containing information on the study and an informed consent letter. These informed consents were signed by each respondent and collected before data collection. Confidentiality was guaranteed to all participants by use of an identification code for every questionnaire. Only one of the researchers had access to the identification list. Participation was on a voluntary base. Appropriate institutional board approval was obtained for this study. In Belgium, approval from the hospital board is required and was granted by all participating hospitals.

Data analysis

For the present study, the Statistical Package for the Social Sciences for Windows 20.0 (IBM SPSS® Inc., Chicago, IL, USA), was used to analyze the data. Descriptive statistics (means, standard deviations, frequency distributions, skewness and kurtosis) were computed. Pearson correlations, One Way ANOVA and Independent Sample-t tests were calculated between predictors and outcomes. Hierarchical regression analyses were conducted to estimate the strength of the association between demographic characteristics (block-1), job characteristics (block-2), organizational variables (block-3) and goal orientation (block-4) as predictors and burnout and work engagement as outcomes. A p-value of 0.05 or lower was considered statistically significant.

3. RESULTS

Personal characteristics (table 1.)

The majority of the ER-Nurses were female (58.8%). The mean age of the respondents was 38.45 years (SD 9.18). More than 85% of the ER-nurses had a bachelor degree and 82% were holders of the specialty 'certified emergency nurse' (CEN). The mean job experience as ER-nurse was 12.07 years (SD 7.99). Almost 59% of the ER-nurses worked full time (38 h/week) and 87.3 % worked in changing shifts, including night shifts. Female gender was related to higher work engagement ($p = .006$). Age correlated negatively with work engagement ($r = -.17$, $p = .03$). No significant differences in the outcome variables were identified for educational level, degree, number of working hours and type of shift work.

Table 1: personal characteristics of the ER-nurses included in this study (N = 170)

Age	<i>Mean (SD)</i>	38,45 (9,18)
Gender	female	58,80%
Nursing degree	qualified nurse	11,20%
	bachelor degree	85,90%
	master degree	2,90%
	Certificate 'certified emergency nurse' (CEN)	81,60%
work schedule	changing shifts without night work	7,40%
	changing shifts with night work	87,30%
	permanent night shifts	5,30%
Job-time	part-time (< 38hour/week)	41,20%
	fulltime (38 hour/week)	58,80%
job experience as ER-nurse	<i>Mean (SD)</i>	12,07 (7,99)
	< 5 years	27,10%
	5-10 years	20,00%
	10-15 years	21,10%
	15-20 years	15,90%
	20-25 years	10,60%
	> 25 years	5,30%

S.D.: standard deviation

Relationships between predictors and outcomes

The correlations between predictors and outcomes are reported in table 2. Correlations between predictors were all lower than .60, excluding the risk for multicollinearity.

Hierarchical regression analyses was performed to estimate the strength of the association between personal characteristics (block 1), job characteristics (block 2), organizational variables (block 3) and goal orientation (block 4) on the one hand and work engagement and burnout, on the other hand. The results of the multiple hierarchical regression analyses are reported in table 3.

Concerning *Work Engagement*, the regression model including only personal characteristics (block 1) explained 8% of variance. Female gender was related to higher levels of work engagement. Job characteristics (block 2) added 20% of explained variance. Job control as well as social support was predictive of work engagement. Organizational variables (block 3) explained an additional 6% of variance. A more positive perception of reward was related to higher levels of work engagement. Goal orientation (block 4) added an extra 14% of explained variance. Mastery approach predicted higher levels of work engagement while performance avoidance had a negative relationship with this outcome variable. The final model explained 47% (adjusted 41%) of variance in work engagement.

For *Burnout*, the regression model including only personal characteristics was not significantly different from the null model. Job characteristics (block 2) explained 26% of variance for burnout. A more positive perception of job demands and job control was related to lower levels of burnout. Organizational variables (block-3) explained an additional 4% of the variance in burnout, but adding this block did not result in a significantly improved regression model. Goal orientation (block-4) added 13% of explained variance. Mastery approach was related to lower levels of burnout. Performance avoidance was related to higher levels of burnout. The final model explained 46% (adjusted 41%) of variance.

Table 2: Inter-correlations (Pearson correlation coefficients) for age, job characteristics and organizational variables from the Leiden Quality of Work Questionnaire for Nurses (LQWQ-N) , goal orientation (GO), Work Engagement (UWES) and Burnout (MBI), together with descriptive data for every variable.

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Age	-													
2. Job demand (LQWQ-N)	-0,09	-												
3. Job control (LQWQ-N)	-0,09	0,32**	-											
4. Social support (LQWQ-N)	-0,12	0,19*	0,40**	-										
5. Work Agreements (LQWQ-N)	-0,08	0,17*	0,12	0,33**	-									
6. Social Harassment (LQWQ-N)	-0,10	0,12	0,22**	0,34**	0,23**	-								
7. Material Resources (LQWQ-N)	0,11	0,07	0,16*	0,06	0,32**	0,13	-							
8. Reward (LQWQ-N)	0,05	0,18*	0,21**	0,28**	0,23**	0,15*	0,18*	-						
9. Mastery-Avoidance (GO)	-0,02	0,08	0,06	-0,07	-0,02	-0,08	0,03	0,01	-					
10. Mastery-Approach (GO)	-0,24**	0,13	0,19*	0,04	0,05	0,03	-0,03	-0,01	0,34**	-				
11. Performance-Approach (GO)	-0,14	0,01	0,12	-0,13	-0,01	-0,09	0,06	-0,07	0,31**	0,22**	-			
12. Performance-Avoidance (GO)	0,03	0,05	0,12	0,08	-0,01	-0,02	0,06	0,06	0,30**	-0,17*	0,28**	-		
13. Work engagement (UWES)	-0,17*	0,20**	0,43**	0,36**	0,20**	0,23**	-0,01	0,33**	0,02	0,40**	-0,01	-0,17*	-	
14. Burnout (MBI)	-0,05	-0,38**	-0,40**	-0,32**	-0,25**	-0,24**	-0,05	-0,27**	0,04	-0,27**	0,14	0,26**	-0,62**	-
<i>M</i>	38.45	11.96	23.99	25.22	10.88	11.79	7.76	11.33	4.83	5.08	3.35	2.85	3.97	46.76
<i>Md</i>	37.50	12.00	24.00	24.00	11.00	12.00	8.00	12.00	5.00	5.00	3.50	2.75	4.00	46.00
<i>SD</i>	9.18	2.22	2.95	3.56	2.11	2.21	1.59	2.71	0.90	0.77	1.18	1.12	1.13	10.38
<i>Range</i>	43.00	14.00	19.00	16.00	12.00	11.00	9.00	12.00	4.20	4.00	5.00	5.00	5.78	54.00

****: correlation is significant at the .01 level (2-tailed) ***: correlation is significant at the .05 level (2-tailed). The lower part of the table gives information about the mean (*M*), median (*MD*), standard deviation (*SD*) and range for each variable. For every variable *N* = 170

Table 3: Summary of hierarchical regression analysis: personal characteristics (block 1), job characteristics (block 2), organizational variables (block 3) and goal orientation (block 4) as predictors and the sum score for work engagement (UWES) and burnout (MBI) as outcomes (N=170).

	Work Engagement		Burnout	
	ΔR^2	β / sign.	ΔR^2	β / sign.
Block 1: Personal characteristics	0,08*		0,04	
Gender		,17*		-,16*
Age		-,02		-,20**
Level of education		-,05		,00
Type of shift work (with(out) night shifts)		,01		,04
Job time (full-time/part-time)		,01		,03
Block 2: Job characteristics	0,20***		0,26***	
Job Demands		,01		-,26***
Job Control		,24***		-,24***
Social Support		,17*		-,11
Block 3: Organizational variables	0,06*		0,04	
Work agreements		,04		-,10
Social harassment		,08		-,09
Material resources		-,11		,07
Reward		,23***		-,11
Block 4: Goal Orientation	0,14***		0,13***	
Mastery-Avoidance (MAv)		-,04		,02
Mastery-Approach (MAp)		,30***		-,18**
Performance-Approach (PAp)		,01		,05
Performance-Avoidance (PAv)		-,20**		,29***
	R^2	0,47	R^2	0,46
	Adj. R^2 model	0,41***	Adj. R^2 model	0,41***

β : beta, ΔR^2 : change in explained variance, adj.: adjusted.

Sign.: significance; * $P < .05$; ** $P < .01$; *** $P < .001$

4. DISCUSSION

The present study in ER-nurses focuses on the relationship between personal characteristics, job characteristics, organizational variables and goal orientation on the one hand and work engagement and burnout on the other hand, in ER-nurses.

Personal characteristics explained a small part of the variance in work engagement. Women were found to have significantly higher levels of work engagement compared to men. Schaufeli & Bakker (2004) also found small to moderate gender differences in work engagement but emphasized the lack of practical significance of these findings. Other studies did not find differences between men and women. Further research is needed.

Work characteristics explained a substantive part of the variance in both of the outcome variables. A positive perception of job demands was predictive of lower levels of burnout. High perceived job control was related to higher levels of work engagement and to lower levels of burnout. High perceived social support was related to higher levels of work engagement. Previous cross-sectional as well as longitudinal studies in (ER)nurses confirm these findings: job characteristics are important predictors of occupational well-being (Adriaenssens et al., 2013; Khamisa, Peltzer & Oldenburg, 2013; Simpson, 2009). These results are also in line with the Job Demand Resources model (Bakker & Demerouti, 2007). This model states that working conditions can be categorized in two distinct groups: job demands and job resources. Job demands are the features of the job that require sustained mental or physical effort, while job resources are the aspects of the job that (1) are functional in achieving work goals, (2) reduce the consequences of high job demands and (3) stimulate personal growth and development (Demerouti et al., 2001). Job control and social support are both considered to be important job resources. Research shows that long lasting high levels of job demands or chronic depletion of resources are both related to burnout. Moreover, increases in job resources were found to predict work engagement (Schaufeli, Bakker & Van Rhenen, 2009).

Organizational variables explained a small part of variance in work engagement. A positive perception of reward was associated with higher levels of work engagement. Van der Ploeg & Kleber (2003) did not find any relationship between financial reward and occupational health outcomes in ER-nurses (Van der Ploeg & Kleber, 2003). The finding of this study can however be explained by the fact that the reward-variable of the LQWQ-N instrument measures a broader concept including appreciation and mutual respect.

Goal orientation explained an additional 14 and 13 % of variance, above personal, work and organizational characteristics, for work engagement and burnout respectively. **Mastery-approach** was found to be related to higher levels of work engagement and to lower levels of burnout. This finding is in

line with hypothesis 1. **Performance avoidance** orientation was inversely related to the outcomes. This finding confirms hypothesis 4. The emotional states related to these types of goal orientation explain the findings: mastery-approach is directly related to positive thinking and well-being (Coats, Janoff-Bulman & Alpert, 1996) and was found to be a predictor of intrinsic motivation, which was in turn negatively related to occupational strain and burnout (Schaufeli & Bakker, 2004). In contrast, avoidant behavior was found to be related to feelings of anxiety and failure, which in turn was predictive of energy depletion, low ability to cope with stress and burnout (Elliot, 2006; Bakker & Demerouti, 2007). More specifically, a performance-avoidance goal orientation proved to be related to low efficacy, high anxiety, less help-seeking and use of self-handicapping strategies (Urduan et al., 2002).

The present study also showed that a **performance-approach** goal orientation was not related to any of the outcome variables. Hypothesis 2 was therefore rejected. Several authors found beneficial effects of a performance-approach goal orientation such as persistence, adaptive help seeking and performance attainment. Other researchers found however no effects or non-beneficial effects on other outcomes such as depression, emotionality, anxiety and job effectiveness (Janssen & Van Yperen, 2004). It is possible that positive and negative effects cancelled each other out in our study, because we used general outcome measures, such as burnout and work engagement. Finally, the present study showed that **mastery-avoidance** was not related to any of the outcome variables. Therefore hypothesis 3 was rejected. In contrast to previous research, the 2x2 model of goal orientation was thus not supported in this study population (Elliot, 2006). Mastery-avoidance goal orientation is the last addition to goal orientation literature and is the least studied and understood dimension. Research suggests that mastery-avoidance is rather a hybrid-concept, combining the most positive aspect of goal achievement (mastery) with the most negative (avoidance). To date, it is not clear how these two components operate together. In certain situations the mastery component seems to dominate, in other contexts the avoidance component seems to be more prominent, while in a significant part of the situations the components cancel each other out. This might explain that for certain groups, such as elderly, employees who function at the maximum of their capabilities or perfectionists, mastery-avoidance can be found as a predominant goal orientation, while in other groups, such as emergency nurses- no significant relationships are found (Elliot & Dweck, 2007).

The finding that goal orientation explained a substantial additional part of the variance in the outcome variables is important in relation to occupational well-being of ER-nurses. Research shows that an employee's goal orientation can influence the social interaction with the supervisor and the quality of leader-employee exchange (Janssen & Van Yperen, 2004). Employees with a mastery-approach goal orientation have a strong focus on developing competences and skills. Supervisors are important resources of knowledge and experience for the ER-nurse. Good social contacts and adequate information exchange with them are primordial for professional growth to attain work related goals and to create

career opportunities. In contrast, employees with an avoidant goal orientation perceive their supervisors as judges or sources of criticism and negative feedback leading to fear of failure (Park et al., 2007). Vice versa, aspects of leadership can influence the goal orientation of the employees. Although goal orientations are seen as rather stable, they can be influenced by contextual and environmental factors (Janssen & Van Yperen, 2004). In order to improve employees' well-being, management has to build an organizational culture that facilitates mastery-approach goal orientation (Janssen & Van Yperen, 2004). Adequate social support, constructive feedback and reward systems based on personal involvement and growth, skills development and cooperation can be very beneficial (Ames, 1992; Janssen & Van Yperen, 2004). Finally, the results of the present study suggest a shift in evaluation methods in nursing education and lifelong learning from performance orientation (with a focus on assessment and examination) towards mastery orientation (with a focus on active learning, clinical decision making and internalizing of information). Ames (1992) emphasized the need to give students more autonomy in their training process and to evaluate them based on improvement and effort rather than on their relative performance (Elliot & Dweck, 2007). Stevens & Gist (1997) showed that mastery-oriented training was related to more skill-maintenance activities, more positive affect and growth of initial low self-efficacy compared to performance-oriented training.

The relatively large sample of ER-nurses compared to other studies, the response rate and the theoretical framework are important strengths of this study. To our knowledge, this study is the first study in ER-nurses that includes JDCS characteristics, organizational variables and goal orientation dimensions in relation to occupational well-being. However, due to its cross-sectional design one has to be cautious to draw conclusions regarding causality. Future longitudinal research is necessary to explore the direction of the findings of this study. Although the response rate of this study was acceptable, more than a third of the eligible respondents did not return the questionnaire, increasing the potential risk of selection bias. Next, due to the sample size of this study the set of predictors is not exhaustive. Personality characteristics, coping strategies and exposure to traumatic events were also found to be related to burnout and work engagement in previous studies but were not included. Future research has to take these weaknesses into account. In this study, social support was conceptualized as an overarching measure including both social support from colleagues and from supervisor. Future research should provide clarification on the unique contribution of each of these. This study shows that occupational goal orientation is strongly predictive of work engagement and burnout in ER-nurses. The authors suggest that future research should explore if the same relationships can also be found in other nursing specialties. Nevertheless, the findings of this study emphasize the need for the creation of a mastery-oriented organizational culture and the facilitation of individual professional growth in order to promote occupational well-being.

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Chapter 6

General discussion.

1. INTRODUCTION

The present thesis concentrates on predictors and outcomes of occupational stress in emergency (ER-) nurses, working in in-hospital emergency wards, ambulance services and fast rescue teams. More specifically, this thesis focuses on the relationships between (1) demographic factors, (2) exposure to traumatic events, (3) job characteristics, (4) organizational variables, (5) coping strategies and (5) goal orientation as potential determinants of (a) job satisfaction, (b) turnover intention, (c) burnout, (d) work engagement, (e) post-traumatic stress symptoms (f) fatigue and (g) other somatic complaints. The first part of this chapter gives an overview of the main results of the different studies, followed by an attempt to integrate all these results from a theoretical and methodological point of view, resulting in a set of practical recommendations and directions for future research.

2. SUMMARY OF THE MAIN RESULTS

Systematic review

The systematic review (*chapter 1*) that is part of this thesis explored the research on burnout in ER-nurses over the last 25 years. A disappointing finding was that the number of studies on burnout in ER-nurses was rather low, that the majority of these studies were not underpinned by a theoretical stress model, and that the sample size was often small. Despite these methodological weaknesses and flaws, the results of the review show a high prevalence of burnout in ER-nurses of 25 % and more. Existing studies also point at the tremendous short and long term consequences of burnout for health professionals, the patients they care for, the health care organization they work in, and the society as a whole.

A first group of determinants for burnout in ER-nurses are the *individual factors*. Concerning demographic characteristics, only age was found to be predictive of burnout but the direction of the relationship was not uniform in the different studies. Personality-characteristics were reported only sparsely as potential determinants of burnout. A higher level of hardiness of the ER-nurse was found to be related to lower levels of emotional exhaustion and depersonalization. Regarding coping strategies, avoidant coping was reported as a determinant of higher levels of emotional exhaustion and depersonalization and of lower levels of personal accomplishment. Finally, in none of the reported studies job attitudes (e.g. goal orientation) were taken into account.

A second group of determinants are the *job related factors*. Repetitive exposure to traumatic events (e.g. suffering, death, mutilation, aggression) in ER-nurses was found to foster the development of burnout. Moreover, ER-nurses reported to have insufficient time to recover emotionally between confrontations with traumatic events. The dimensions of the Job-Demand-Control-Support (JDCS) model (Karasek & Theorell, 1990) were reported as strong determinants of burnout. High job demands, low job control, as well as low social support were found to be related to higher levels of emotional exhaustion and

depersonalization and to more negative feelings of personal accomplishment. Next to job characteristics, the organization of the work environment at the emergency department was found to be related to the development of burnout. Good organizational and interdisciplinary communication and collaboration were reported to be related to lower levels of burnout in ER-nurses. Subsequently, inadequacy of material and staffing resources, or maladaptive work schedules and (night) shift-work were found to be related to higher levels of emotional exhaustion and depersonalization. Next, a more innovative culture on the ward was related to lower levels of emotional exhaustion. Finally, no significant relationships between perceived reward and any dimension of burnout were found in the selected studies.

Empirical research conducted for this thesis

Chapter 2 reports the results of a cross-sectional study that explored (1) whether ER-nurses differ from a general nursing comparison group in terms of job- and organizational characteristics and (2) to what extent these characteristics predict job satisfaction, turnover intention, work engagement, fatigue and psychosomatic distress. ER-nurses were found to experience higher levels of time pressure and physical demands, lower levels of decision authority, less adequate work procedures and less reward than their peers from a general hospital nursing population. However, ER-nurses also reported more opportunity for skill discretion and better social support by their colleagues. A negative perception of work-time demands was related to higher levels of psychosomatic complaints and more fatigue. A more positive perception of decision authority, skill discretion, adequate work procedures, perceived reward and social support by the supervisor (head nurse) were all strongly related to higher levels of job satisfaction, more work engagement and lower turnover intention in ER-nurses.

Chapter 3 describes the results of a cross-sectional study in ER-nurses that examined (1) the frequency of exposure to and the nature of traumatic events, (2) the prevalence of symptoms of post-traumatic stress disorder (PTSD), anxiety, depression, somatic complaints and fatigue at a (sub-)clinical level, and (3) to what extent the frequency of exposure to traumatic events, coping and social support contribute to the explanation of PTSD-symptoms, psychological distress, somatic complaints, fatigue and sleep disturbances. ER-nurses were found to be confronted frequently with work related traumatic events. Death and serious injury of children and adolescents and the handling of victims of car crashes were reported as the most traumatizing events. Almost a third of the respondents met sub-clinical levels of anxiety, depression and somatic complaints and 8.5% met clinical levels of PTSD. Frequency of exposure to traumatic events was related to PTSD-symptoms, psychological distress, somatic complaints and sleep problems. Levels of fatigue in ER-nurses were high but were however not directly related to the frequency of exposure to traumatic events. Emotional coping was related to an increase in all outcome variables. Avoidant coping was related to more somatic complaints. Problem focused coping was related to a decrease in psychological distress and perceived fatigue. Social support from the supervisor

(head nurse) was related to lower levels of PTSD, psychological distress, perceived fatigue and somatic complaints. Social support from colleagues was found to be related to lower levels of fatigue.

Chapter 4 is the report of a longitudinal study in ER-nurses, with a baseline measurement and one follow-up measurement 18 months later, that examined the influence of changes over time in work and organizational characteristics on job satisfaction, work engagement, emotional exhaustion, turnover intention and psychosomatic distress. The turnover rate in ER-nurses over a period of 18 months was almost 20% (range 5% - 36%). Important changes over time, in a positive as well as in a negative direction, were found in both predictors and outcomes. Better perceived job demands over time was predictive of more job satisfaction and lower levels of emotional exhaustion. A rise in job control was related to higher job satisfaction and more work engagement. More positively perceived social support over time was predictive for higher job satisfaction and lower levels of emotional exhaustion. Additionally, a more positive perception of social harassment was related to lower levels of emotional exhaustion and psychosomatic distress. Better perception of work procedures was related to lower turnover intention. Better availability of material resources was predictive of less psychosomatic distress. Finally, more positively perceived reward was related to higher work engagement.

Chapter 5 describes the results of a cross-sectional study that explored to what extent the 4-dimensional model of goal orientation (Vandewalle, 1997; Baranik, Barron, & Finney, 2007) added additional variance to the explanation of burnout and work engagement in ER-nurses, after controlling for demographics, job characteristics and organizational variables. Female gender was found to be related to lower levels of burnout and higher levels of work engagement. Job characteristics were strong determinants of the two outcome variables. A more positive perception of job control and social support was found to be related to higher levels work engagement. The perception of job demands and job control was negatively related to burnout. Goal orientation explained a significant additional part of variance of both outcome variables, above job characteristics and organizational variables. Mastery-approach goal orientation was strongly related to an increase in work engagement and a decrease in burnout. Performance-avoidance goal orientation was strongly related to a decrease in work engagement and to an increase in burnout. Performance-approach and mastery-avoidance goal orientation showed no significant relationships with the two outcomes.

3. BRINGING IT ALL TOGETHER: CONSISTENCIES AND INCONSISTENCIES

The results of the cross-sectional study (*chapter 2*) reveal that ER-nurses experience higher levels of job demands and lower levels of job control than their colleagues in other nursing wards. ER-nurses also reported however higher levels of skill discretion and social support than the nursing reference group. As described in the systematic review (*chapter 1*), emergency departments are indeed stressful, hectic and unpredictable work environments and have a high time pace. Besides, ER-nurses are confronted

frequently with traumatic events. These are important stressors resulting in higher levels of psychological distress and somatic complaints. Almost one third of the ER-nurses report subclinical levels of anxiety, depression and somatic complaints and 8.5% met clinical levels of PTSD-symptoms (*chapter 3*). The abovementioned findings support the idea that every nursing specialty has its own specific set of stressors, related to the specific content of the job (Browning, Ryan, Thomas, Greenberg, & Rolniak, 2007). This emphasizes the need to explore the relationships between these specific stressors and potential stress-health outcomes, in order to prevent negative consequences and promote occupational well-being. However, working in emergency departments also seems to be challenging for the health professionals and requires more advanced nursing skills (*chapter 2*). Emergency departments might therefore be good work environments for ER-nurses with a mastery approach goal orientation, who strive to develop skills and competencies and who like to be triggered by new challenges and innovative approaches.

The dimensions of the JDCS-model (Karasek & Theorell, 1990) explained the biggest part of variance for the different outcomes in the cross-sectional studies at baseline (*chapter 2*) and follow-up (*chapter 5*). Also changes over time in the JDCS-variables were found to be strongly predictive for stress health outcomes (*chapter 4*). A positive perception of job demands was found to be related to lower levels of fatigue and psychosomatic distress and burnout (*chapter 2 and 5*) in ER-nurses. A more positive perception over time for this variable was predictive of more job satisfaction and lower levels of emotional exhaustion (*chapter 4*). Adequate levels of job control, in terms of skill discretion and decision authority, were found to be related to higher job satisfaction, more work engagement, lower turnover intention and less burnout (*chapter 2 and 5*). The results of the longitudinal study confirmed this relationship for job satisfaction and work engagement (*chapter 4*). This is also in line with previous research in ER-nurses (*chapter 1*) and in other professional populations (Van der Doef & Maes, 1999; Hausser, Mojzisch, Niesel, & Schulz-Hardt, 2010). Social support on the work floor (as a general measure), was related to higher levels of work engagement and less burnout (*chapter 5*). A more positive perception over time of social support was related to more job satisfaction and lower levels of emotional exhaustion in ER-nurses (*chapter 4*). More specific, adequate social support by the supervisor (head nurse) was found to be related to higher levels of work engagement and less psychosomatic distress (*chapter 2*). Moreover, support by the supervisor seems to act as a buffer against the consequences of exposure to traumatic events, resulting in lower levels of post-traumatic stress symptoms, psychological distress and somatic complaints (*chapter 3*). These findings emphasize the need of supportive high-quality nursing leadership in emergency departments. Adequate social support from colleagues was found to be related to higher job satisfaction (*chapter 2*) and to lower levels of fatigue (*chapter 3*). This finding calls for continuous investment in a good team spirit and group cohesion in

emergency departments. The results of the systematic review (*chapter 1*) confirm the findings concerning both social support from the supervisor and colleagues.

In an attempt to explain more variance in the relationships between potential stressors and the different occupational well-being outcomes in ER-nurses, the cross-sectional (*chapter 2*) as well as the longitudinal study (*chapter 4*) of this thesis included organizational characteristics as predictors, derived from the Tripod Accident Causation Model (Wagenaar et al, 1990, Wagenaar et al, 1994). The cross-sectional study showed that a positive perception of reward was related to more job satisfaction, more work engagement and less turnover intention and that a positive perception of the quality of work procedures was related to more work engagement and lower levels of fatigue (*chapter 2*). In the longitudinal study (*chapter 4*) only the positive relationship between reward and work engagement over time remained significant. Positive evolutions over time of the perception of work agreements and material resources were also found to be longitudinal predictors of turnover intention and material resources respectively. The difference between the results of the cross-sectional and longitudinal study might be due to the fact (1) that JDCS-variables already accounted for a large part of variance in job satisfaction, work engagement and emotional exhaustion at follow-up, (2) that organizational variables, especially in a hectic and constantly changing emergency work environment, might only have short term effects on ER-nurses because of legal demands (e.g. personnel shortage, problems with work procedures and lack of material resources have to be solved in a very short time because of the governmental quality regulations) in contrast to the rather stable governmental reward system (a fixed scale fee system) and (3) that almost 20% of the (dissatisfied?) respondents left the participating emergency departments between the baseline and follow up measurement.

Nevertheless, JDCS- and organizational variables are important predictors of stress-health outcomes in ER-nurses. Moreover, important changes over time in predictors and outcomes were found. This provides opportunities to intervene in the predictors in order to improve both work conditions and outcomes. The findings of the different empirical studies in ER-nurses in this thesis are also in line with the Job-Demand Resources model (Bakker & Demerouti, 2007) that distinguishes between two important processes: a motivational process that is based on available resources, in terms of job control, social support, reward and an energy depletion process that is caused by high demands or exposure to traumatic events. Depletion of resources can be prevented by means of avoiding continuous exposure to demands or traumatic events and allowing for sufficient time for both physical and emotional recovery. Resources can be built up or increased by giving more autonomy over the individual practice of the ER-nurse, providing high quality supportive leadership, creating a good team spirit, providing clear multidisciplinary work procedures, and invest in adequate levels of appreciation and a well-balanced salary.

Age and gender were found to be related to turnover intention in the cross-sectional study (*chapter 2*). Gender was also cross-sectionally related to work engagement and burnout (*chapter 5*) and fatigue (*chapter 3*). However, these findings were not confirmed in the longitudinal study (*chapter 4*). A possible explanation for this is selective attrition over the measurement moments.

Finally the results of the study on goal orientation (*chapter 5*) did not confirm the 2x2 goal orientation model. Mastery approach was positively and strongly related to higher levels of work engagement and lower levels of burnout while performance avoidance showed an opposite relationship. This is in line with previous research, that shows that mastery approach is related to positive thinking and well-being (Coats, Janoff-Bulman, & Alpert, 1996; Schaufeli & Bakker, 2004) while performance avoidance is related to feelings of anxiety and failure (Urdu, Ryan, Anderman, & Gheen, 2002). No relationship was found between performance approach and mastery avoidance on the one hand and work engagement and burnout on the other hand. The use of general outcome measures (burnout and work engagement) might have led to the fact that positive and negative effects of these types of goal orientation have canceled each other out. In any case, future studies are necessary to further explore the validity of the 2x2 orientation model.

4. THEORETICAL CONSIDERATIONS

As expected, based on previous research, the JDCS-variables explained significant parts of the variance in the different outcome measures of occupational well-being in ER-nurses. The studies in this thesis show however that the addition of other potential variables (e.g. organizational variables, exposure to traumatic events, goal orientation), can improve the understanding of the development of occupational stress in this group of health care professionals. Organizational variables, as derived from the Tripod Accident Causation model, showed to be predictive of several outcome variables (*chapter 2 and 4*). The organization of the work environment and the (in)availability of certain resources seem to have an influence on the way ER-nurses are able to deal with the stressors in the content of their work. For example, adequate staffing, clear work procedures and sufficient material resources can partly solve the problem of high work demands. The frequency of exposure to occupation-related traumatic events and the coping strategy used to manage these experiences also showed to have important consequences for the well-being of ER-nurses. This finding emphasizes the need to take into account the exposure of the ER-nurse to a broad set of stressors, as well as the individual appraisal and coping of these experiences. Moreover, social support (a JDCS-variable) was found to have a buffering effect on the negative consequence of these traumatic events. Finally, goal orientation explained additional variance in work engagement and burnout, over and above personal, work(JDCS) and organizational variables. The orientation of a person to achieve job related goals can be seen as an underlying mental process that gives meaning (or 'color') to certain stimuli and stressors, in terms of challenge or threat.

5. STRENGTHS AND LIMITATIONS

An important strength of this thesis on occupational stress and well-being in emergency nurses is that all of the studies are underpinned by a broad set of robust scientific stress models, i.e. the JDCS-model, the Tripod Accident Causation Model, the PTSD development model and the Goal Orientation model. Even more important, the studies go beyond the classic unilateral approach of job-content related factors (JDCS-variables) as predictors of occupational stress. Furthermore the studies are based on a relatively large sample of ER-nurses compared to other studies and managed to have a quite high response rate. Moreover, all of these studies started from an interactional/transactional view on occupational well-being, taking into account the exposure to environmental stimuli as well as the individual information processing of these experiences, in terms of appraisal and coping, resulting in a set of occupational well-being consequences. The study on exposure to traumatic events in ER-nurses is innovative because it reveals that a considerable number of ER-nurses exceeds (sub)clinical levels of psychological and somatic complaints. And finally, the study in chapter 5 demonstrated that goal orientation explains a significant part of additional variance in burnout and work engagement, after controlling for personal characteristics, job characteristics and organizational variables.

A limitation of this thesis is that only a part of the stressor sets (JDCS & Tripod) was assessed by means of a longitudinal design that included only one follow-up measurement point (*chapter 2 and 4*). The other studies on exposure to traumatic events and on goal orientation in ER-nurses had a cross-sectional design. This implies that one has to be cautious to draw conclusions regarding causality. Future longitudinal studies have to confirm the results. Furthermore, institutional characteristics such as size and location (rural, urban) of the included hospitals were not included, and should be taken into account in future research. Another limitation is that all the studies were conducted in one country, thereby not taking into account cultural or contextual factors. Future cross-national studies are therefore necessary. Finally the significant but unavoidable drop-out in the longitudinal study of almost 20%, caused by the high turnover rate in the period between the baseline and the follow up measurement, has to be kept in mind for generalization of the results. Despite these limitations, the studies of this thesis are innovative because of the model based research approach and the broad set of individual factors and job related stressors that are included. Moreover, these results provide tools and handles to promote well-being for ER-nurses on the work floor.

6. PRACTICAL CONSIDERATIONS

The results of the studies in this thesis, taking into account the methodological considerations described above, show that ER-nurses are confronted with a broad set of occupational stressors, resulting in a decrease in occupational well-being, job satisfaction and work engagement, and a rise in turnover intention, psychosomatic distress, fatigue and burnout. These findings are indeed important to retain the

present workforce, to attract future employees and to prevent loss of human capital. Health care managers and nursing supervisors (head nurses) should be triggered to set up work-related interventions at lowering job demands, increasing job control, building a good team spirit, investing in adequate peer social support, providing clear and uniform work procedures, facilitating innovative ideas of the team members and striving for a well-balanced commitment related reward system. Subsequently, hospital management should train and educate their team supervisors in the use of participative empathic transformational leadership techniques that encourage and facilitate innovative approaches. The results of the different studies also underpin the idea of regularly screening nurses in (emergency) wards on the perception of job characteristics, organizational variables and confrontation with traumatic events. Moreover, emergency departments as an entity should also be screened on the adequacy of available resources. Subsequently, ER-nurses need to be coached on a regular basis in order to give them maximum opportunities to achieve their professional goals and fully realize their capacities and skills.

7. FUTURE DIRECTIONS

The studies included in this thesis expand the scientific knowledge on the development of occupational stress or well-being in ER-nurses. Although a substantial part of the variance of the different outcomes was explained, a significant part of the variance still remains unaccounted for and research should explore other potential determinants. Future studies on stress-health outcomes in ER-nurses should e.g. take into account personality traits such as neuroticism, conscientiousness, extraversion, openness to experience, flexibility, indulgence and perfectionism as predictors of occupational well-being. A better understanding of the influence of these personality traits on the performance and health of ER-nurses at the work floor could improve leadership and management techniques. Also the role of self-care of the ER-nurse in terms of lifestyle, unhealthy coping strategies, guarding your limits and dealing with sick leave as mediator of occupational well-being should be investigated. Specific attention could also be given to the work-life balance, conflicting demands and emotional support at home of the ER-nurse. Because of the continuous shift work (including night shifts) and the hectic high paced work conditions on emergency departments, the work-home interface might be another interesting dimension to explore. Next, more research has to be conducted to refine the relationship of goal orientation on the one hand and occupational health outcomes and nurse retention on the other hand. Finally there is a strong need to conduct more longitudinal research on the relations between occupational stress predictors and outcomes in ER-nurses.

Secondly, research should be set up to measure the effectiveness of targeted organizational and behavioral interventions (1) to improve the conditions in the emergency department in terms of job content and work organization, (2) to create a good (interdisciplinary) team spirit and group cohesion as a source of social support, (3) to improve mental resilience and hardiness in order to help ER-nurses to manage their hectic and unpredictable work conditions, (4) to promote the use adaptive coping

mechanisms, (5) to support and provide counseling for ER-personnel that is confronted with traumatic events, (6) to train nursing supervisors in the use of transformational supportive leadership and (7) to create a challenging work environment with emphasis on innovation and skill discretion.

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Samenvatting

(Dutch summary)

1. INTRODUCTIE

Dit proefschrift focust op de voorspellende factoren en gevolgen van werkstress bij Spoedeisende Hulp (SEH-) verpleegkundigen. Meer specifiek richt deze thesis zich op verbanden tussen (1) persoonskenmerken van de respondenten, (2) blootstelling aan traumatische incidenten, (3) jobgerelateerde kenmerken, (4) organisatorische variabelen, (5) coping-strategieën en (6) doeloriëntatie als potentiële determinanten van (a) tevredenheid op het werk, (b) verloopintentie, (c) burn-out, (d) werkbevlogenheid, (e) post-traumatische stress symptomen, (f) vermoeidheidsklachten en (g) andere somatische klachten.

2. OVERZICHTSSTUDIE

De overzichtsstudie (*hoofdstuk 1*) omvat het onderzoek over burn-out bij SEH-verpleegkundigen, dat verricht werd in de voorbije 25 jaar. Een eerste belangrijke bevinding is dat er slechts een beperkt aantal bruikbare studies werd gevonden. Tevens bleek dat de meeste onderzoeken niet onderbouwd waren met een theoretisch stressmodel. Vaak was ook de steekproef van de studies klein. Op grond van de geselecteerde studies blijkt burn-out voor te komen bij minstens 25% van de SEH-verpleegkundigen.

Een eerste groep determinanten van burn-out bij SEH-verpleegkundigen zijn *persoonkenmerken*. Leeftijd was de enige demografische voorspeller voor burn-out maar de resultaten gaan niet steeds in dezelfde richting. Persoonlijkheidsfactoren werden schaars meegenomen in onderzoek. SEH-verpleegkundigen die hoog scoorden op 'hardiness' bleken minder hoog te scoren op de dimensies emotionele uitputting en depersonalisatie/distantie. Vermijdend coping-gedrag bleek gerelateerd aan hogere niveaus van emotionele uitputting en depersonalisatie/distantie en aan lagere niveaus van persoonlijke bekwaamheid.

Een tweede groep determinanten zijn de *werkgerelateerde factoren*. Herhaalde blootstelling aan traumatische incidenten (vb. ondraaglijk lijden, dood, verminking, agressie) bij SEH-verpleegkundigen was gerelateerd aan burn-out. Bovendien wordt in *de* geïncludeerde onderzoeken gesteld dat verpleegkundigen vaak te weinig tijd hebben om te recupereren tussen twee traumatische gebeurtenissen. De jobgerelateerde dimensies van het Job Demand-Control-Support (JDCS) model (Karasek & Theorell, 1990) blijken sterke predictoren van burn-out. Zowel hoge werkeisen, weinig controle over het werk als een tekort aan sociale ondersteuning door zowel leidinggevenden als collega's waren predictief voor hogere niveaus van emotionele uitputting en depersonalisatie/distantie en negatieve perceptie van eigen bekwaamheid. Naast de inhoud van het werk werd ook de organisatie van de werkomgeving beschreven als voorspeller voor burn-out bij SEH-verpleegkundigen. Goede organisatiebrede en interdisciplinaire communicatie en samenwerking was gerelateerd aan lagere niveaus van burn-out. Ontoereikende bestaffing, logistieke en materiële tekorten, onaangepaste werkschema's, nachtwerk en ploegendienst waren gerelateerd aan hogere niveaus van emotionele

uitputting en depersonalisatie/distantie. Vervolgens werd een innovatieve cultuur op de afdeling gerelateerd aan lagere niveaus van emotionele uitputting.

3. HET EMPIRISCH ONDERZOEK

Hoofdstuk 2 rapporteert de resultaten van een cross-sectionele studie die onderzocht (1) in welke mate SEH-verpleegkundigen verschillen van een groep van algemeen verpleegkundigen op het vlak van jobgerelateerde en organisatorische variabelen, en (2) hoe deze variabelen gerelateerd zijn aan arbeidstevredenheid, verloopintentie, vermoeidheid en psychosomatische stressklachten. SEH-verpleegkundigen bleken geconfronteerd te worden met een hogere tijdsdruk en zwaardere fysieke belasting, minder eigen beslissingsmogelijkheden, slechter afgestemde werkprocedures en een negatievere perceptie van beloning en appreciatie dan hun collega's van de andere verpleegafdelingen. Nochtans scoorden SEH-verpleegkundigen hoger op ontwikkelingskansen en rapporteerden zij een betere sociale ondersteuning door hun collega's. Tijdsdruk en hoge werkeisen waren gerelateerd aan meer psychosomatische klachten en vermoeidheid. Controle over het werk, persoonlijke ontwikkelingskansen, werkprocedures en afspraken, beloning en appreciatie en sociale ondersteuning door de leidinggevende (hoofdverpleegkundige) waren sterk positief gerelateerd aan arbeidstevredenheid en bevoegenheid op het werk en negatief aan verloopintentie.

Hoofdstuk 3 beschrijft de resultaten van een cross-sectionele studie die onderzocht (1) hoe frequent SEH-verpleegkundigen blootgesteld worden aan traumatische incidenten, (2) in welke mate deze groep lijdt aan post-traumatische stress reacties (PTSR), angst, depressie, somatische klachten en vermoeidheidsklachten, en (3) in welke mate de frequentie van blootstelling aan traumatische incidenten, de gehanteerde coping-strategie en de mate van sociale ondersteuning op de werkvloer bijdragen aan het optreden van PTSR-symptomen, psychologische distress, somatische klachten, vermoeidheid en slaapproblemen. SEH-verpleegkundigen bleken frequent blootgesteld te worden aan werkgerelateerde traumatische incidenten. Confrontatie met het overlijden en de zorg voor ernstige letsels bij kinderen en adolescenten en het omgaan met slachtoffers van verkeersongevallen werden aangegeven als meest traumatiserend. Bijna een derde van de respondenten rapporteerde subklinische niveaus van angst, depressie en somatische klachten en 8.5% rapporteerde klinische niveaus van PTSR. De frequentie van blootstelling aan traumatische incidenten was positief gerelateerd aan PTSR-symptomen, psychologische distress, somatische klachten en slaapproblemen. De mate van vermoeidheid bij SEH-verpleegkundigen was hoog maar was niet gerelateerd aan frequentie van blootstelling. Een emotionele copingstrategie was geassocieerd aan meer klachten. Een vermijdende copingstrategie was gerelateerd aan meer somatische klachten. Probleem-georiënteerde coping was echter gerelateerd aan minder psychologische distress en ervaren vermoeidheid. Sociale ondersteuning door de hoofdverpleegkundige was gerelateerd aan lagere niveaus van PTSR, psychologische distress,

vermoeidheid en somatische klachten. Sociale ondersteuning van collega's was gerelateerd aan lagere niveaus van vermoeidheidsklachten.

Hoofdstuk 4 betreft een longitudinale studie bij SEH-verpleegkundigen, met een baseline-meting en een follow-up meting 18 maanden later. Hierin werd het effect nagegaan van jobgerelateerde en organisatiegebonden factoren op verloopintentie en psychosomatische distress. Het effectieve verloop van verpleegkundigen tussen de twee metingen was bijna 20% (range 5% - 36%). Significante veranderingen over de tijd, zowel in positieve als negatieve zin, werden gevonden voor zowel de predictoren als de outcomes van de studie. Een positievere ervaring over de tijd van werkeisen was predictief voor meer arbeidstevredenheid en lagere niveaus van mentale uitputting. Meer controle over het werk was gerelateerd aan meer arbeidstevredenheid en een hogere mate van bevlogenheid. Sociale steun was predictief voor meer arbeidstevredenheid en minder mentale uitputting. Lagere niveaus van sociale uitsluiting en intimidatie waren gerelateerd aan lagere niveaus van mentale uitputting en psychosomatische stress. Een positievere perceptie van werkprocedures was gerelateerd aan een verminderde verloopintentie. Een verbeterde beschikbaarheid en kwaliteit van materiaal en apparatuur was predictief voor minder psychosomatische klachten. Ten slotte was een positievere perceptie over de tijd van beloning en appreciatie gerelateerd aan hogere niveaus van bevlogenheid op het werk.

Hoofdstuk 5 beschrijft de resultaten van een cross-sectionele studie die onderzocht in welke mate het 4-dimensionale model van 'goal orientation' (doeloriëntatie) (Vandewalle, 1997; Baranik, Barron & Finney, 2007) bijkomende variantie verklaart in burn-out en bevlogenheid op het werk bij SEH-verpleegkundigen, na controle voor socio-demografische factoren, jobgerelateerde factoren en organisatorische variabelen. Vrouwelijke respondenten rapporteerden lagere niveaus van burn-out en hogere niveaus van bevlogenheid. Jobgerelateerde factoren waren sterke determinanten van beide outcome variabelen. Controle over het werk en sociale ondersteuning waren gerelateerd aan een hogere mate van bevlogenheid. Lagere werkdruk en meer controle over het werk waren negatief gerelateerd aan burn-out. 'Goal orientation' verklaarde een significant bijkomend deel van de variantie in beide variabelen, bovenop de jobgerelateerde factoren en organisatorische variabelen. 'Mastery-Approach goal orientation' was sterk gerelateerd aan meer bevlogenheid en minder burn-out. 'Performance-Avoidance goal orientation' was sterk gerelateerd aan minder bevlogenheid en meer burn-out. 'Performance-Approach' en 'Mastery-Avoidance' toonden geen van beiden een significante relatie met beide outcome variabelen.

4. GENERAL DISCUSSION

In hoofdstuk 6 zijn al de bevindingen van dit proefschrift samengebracht en bekeken vanuit onderliggende theoretische modellen en concepten van kwaliteit van arbeid. Hierbij werd ook gekeken naar de overeenkomsten en tegenstrijdigheden tussen de resultaten van de verschillende onderzoeken. De sterke en zwakke punten van het proefschrift werden besproken. Ten slotte werden de implicaties van het proefschrift voor toekomstig onderzoek beschreven.

Samengevat kan gesteld worden dat dit proefschrift, op basis van diverse theoretische modellen en concepten, een breed gamma van persoonsgebonden en werkgerelateerde stressoren bij SEH-verpleegkundigen heeft onderzocht. De resultaten wijzen ook op een aantal bufferende factoren om de negatieve effecten van deze stressoren te ondervangen. De resultaten van de studies bieden een handvat voor de ontwikkeling en de implementatie van interventies om de werkomstandigheden van de SEH-verpleegkundige te optimaliseren. De bevindingen van deze thesis tonen aan dat er voor SEH-nood is aan 'zorg voor de zorgenden'

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Curriculum Vitae

Jef Adriaenssens was born in 1964 in Herentals, Belgium. He completed his secondary school education in 1982 at the St.-Pietersinstituut in Turnhout, Belgium. In 1985 he earned a bachelor degree in hospital nursing, followed by a bachelor degree in pediatric nursing in 1986, in HIVSET in Turnhout. In 1991 he graduated as certified emergency nurse in VVC-NVKVV in Brussels. For more than 28 years he worked as an emergency and ambulance nurse in the St.-Jozef hospital in Malle, Belgium. In 2008 he received a Master degree in Nursing & Midwifery at the University of Antwerp (Belgium). That year, he started his PhD-research at the Clinical and Health Psychology Department of Leiden University. Since 2009 he coordinates a scientific dissemination platform for nurses and midwives in Flanders and he is also lecturer in nursing science in Thomas More University College (Belgium). In September 2014 he became coordinator for Continuing Vocational Education and Training (CVET) at a national federation of nurses (NVKVV). Besides these functions, he is actively involved in several scientific groups and health care organizations.