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Predictors of occupational stress and well-being in First-Line Nurse Managers : cross-sectional survey study

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1 **ABSTRACT**

2 *Background:* First-line nurse managers have a pivotal role in the organization of health care but have to
3 deal with significant job-related issues and problems in a changing and challenging health care
4 environment. As their new roles are complex and often unclear, it might be expected that these
5 professionals are at risk for occupational stress. *Objectives:* The objective of this study is to analyze and
6 describe relationships between job characteristics, and also interdisciplinary conflicts with physicians as
7 potential predictors of occupational well-being (job satisfaction, psychosomatic distress, turnover
8 intention, work engagement and burnout). *Design:* this study had a cross-sectional design and used a
9 web-based survey. *Methods:* This study was conducted in 2015 in 11 Belgian (Flemish) hospitals. All First-
10 line nurse managers were eligible (N = 481) and 318 respondents (66.1%) agreed to take part in the
11 survey. A hierarchical regression analyses was applied to analyze relationships between predictors and
12 outcomes. *Results:* job demand and job control measures were predictive of all outcomes. Collaboration
13 with doctors only predicted job satisfaction and turnover intention. Social support from management was
14 predictive of turnover intention. Social support from colleague- first-line nurse managers was not
15 predictive. Social support from the staff members (team) was however a strong predictor of all stress
16 outcomes. *Conclusions:* Job demands, job control and social support of the team and management were
17 all important predictors of occupational well-being in first-line nurse managers. All of these variables can
18 be influenced by hospital management to improve the work conditions of this professional group in order
19 to retain their workforce.

21 **Key words:** burnout, job satisfaction, nurse managers, turnover intentions, work engagement,
22 cooperative behavior, stress, team collaboration

24 **BULLET POINTS**

25 What is already known

- 26 • First-line nurse managers have a pivotal role in health care and have to deal with a broad range of
27 professional and non-professional stakeholders.
- 28 • The role of the first-line nurse manager has changed tremendously in the last decades.
- 29 • The present role of the first-line nurse manager is complex and unclear, what might result in
30 occupational stress and turnover.

31 What this paper adds

- 32 • Job demands was predictive of job satisfaction, psychosomatic distress and burnout and job
33 control was a predictor of all occupational stress and well-being measures.
- 34 • Collaboration with doctors was only predictive of job satisfaction and turnover intention.
- 35 • Social support of team members (nursing staff) was found to be a strong predictor of
36 occupational well-being in first-line nurse managers. This finding is a new and more research is
37 needed.
- 38 • Social support from management is predictive of turnover intention.

Predictors of occupational stress and well-being in First-Line Nurse Managers: a cross-sectional survey study

1 Introduction

1.1 Background

First-line nurse managers, also called ward sister, ward manager, nursing unit manager or matron, have the role to oversee and direct the activities of nurses in a specific unit of a hospital or medical facility. They have a pivotal role in the organization of health care (Anthony et al., 2005) as they directly have to deal with a broad range of key players in the health care process, such as staff nurses, supporting staff, middle managers, top management, doctors, patients and family. Moreover, their performance, in terms of leadership and management, is found to have a significant influence on the quality and safety of care, and the well-being of their staff members (Al Maqbali, 2015; Fuller, 2015). A systematic review on occupational stress in first-line nurse managers revealed that the role of first-line nurse managers has expanded tremendously in the past decades (Shirey et al, 2006). Before 1990, the traditional 'ward sisters' had to manage activities for their team of nurses with limited responsibility for financial issues and quality assurance. In the following decades, there has been a strong worldwide restructuring of health care, resulting in more interdisciplinary and (transmural) integrative collaboration, more emphasis on operational performance, financial tenability and quality of care, and introduction of performance and outcome monitoring in nursing care. Moreover, health care organizations are confronted with significant nurse shortages as well as a policy of financial austerity, resulting in tight operational budgets. The FLNM's role has also shifted from 'a function within the team', often part-time delivery of bedside care, to a more administrative and distant role as a manager of a micro-system with frequent external meetings (Shirey, 2006). These new roles have negatively led to overloaded, conflicting, and ambiguous roles of the first-line nurse managers (Miri et al, 2014). Due to the nature of their job, at the crossroad of collaborative care processes, first-line nurse managers have to deal with competing demands and values (Quinn & Rohrbaugh, 1983; Shirey, 2006; Udod & Care, 2011). This implies that the FLNM's role became more complex and unclear (Fischer, 2016; Kath, Stichler, Ehrhart, & Schultze, 2013). Consequently, it might be expected that this altered work role will have an impact on occupational well-being in first-line nurse managers.

A broad range of studies on occupational stress and well-being in nurses in a myriad of work environments, such as general wards, emergency care, mental health care, showed that the FLNM was involved as a potential source of work stress or work engagement (Adriaenssens et al., 2015; Nowrouzi et al., 2015). Indeed, adequate participative nursing leadership, provided by a FLNM is a strong predictor of occupational well-being and performance of the staff members (Adriaenssens, De Gucht, & Maes, 2015). On the other hand, research revealed that the role and specialty of a nurse implies specific stressors and is as such predictive of occupational stress and burnout (Browning, Ryan, Thomas, Greenberg, & Rolniak,

2007). Studies on occupational stress in first-line nurse managers are however sparse. Literature searches on Medline and CINAHL (February 2017) for studies over the last 10 years on burnout and occupational stress in first-line nurse managers, including synonyms such as head nurse, ward sister, matron and nurse leader, resulted in 10 relevant primary studies and no systematic review. Nevertheless, a recent study shows that one out of six first-line nurse managers reported high to very high feelings of emotional exhaustion, with work/time pressure, job control, social support, role conflict and role meaningfulness as significant predictors (Van Bogaert et al., 2014). Hewko et al (2015) revealed that high workload, inability to ensure quality of care, insufficient resources and lack of empowerment, respect and recognition are predictive of job dissatisfaction and turnover intention. Qualitative research by Shirey et al (2010) showed that personnel and material resources, tasks and workload, and performance expectations influence nurse managers' perceptions of stress. And Warhsawsky & Havens (2014) found a positive relationship between job satisfaction and job retention in first-line nurse managers. Taking into account the central important role of the FLNM in hospitals, specific attention on occupational well-being in this group is important to preserve the workforce.

1.2 Theoretical framework

Occupational stress can be described as a multi-factorial interaction between personal and personality variables of the employee on the one hand and work content and organizational characteristics on the other hand (Hart & Cooper, 2001). The result of this interaction, in terms of occupational well-being, is provoked by the perception of the employees of their own strengths and weaknesses versus their work environment. This perception is colored by the employee through the appraisal of the environment and to what extent he can cope with it (Folkman & Lazarus, 1988). This complex interactional process, called 'the person-environment fit' determines how the employee perceives his work environment (e.g. stimulating, challenging, threatening or toxic) and results in a number of psychological and physiologic reactions (Caplan, 1987).

Occupational stress and occupational well-being are closely related. Based on the Job Demand Resources model, working conditions can be categorized in two distinct groups: job demands and job resources. Job demands (stressors) are the features of the job that require sustained mental or physical effort, while job resources are the aspects of the job that are functional in achieving work goals, reduce the consequences of high job demands and stimulate personal growth and development (Demerouti et al, 2001). Job control and social support are both considered to be important job resources. Job control is the individual's potential control over his task and his conduct during the working day and his opportunities to grow. Research shows that jobs can be categorized in terms of job demands and job control, resulting in 4 subgroups: low demand/low control (passive jobs, decrease in motivation, lack of problem solving skills), low demand/high control (low strain job), high demand/high control (active job, might improve learning and motivation to develop new skills) and high demand/low control (high strain job, risk for psychological and physical distress and illness). In addition, job control can act as a buffer for the negative

consequences of high job demands (Ibrahim & Ohtsuka, 2014; Karasek & Theorell, 1990; Van Der Doef & Maes, 1998, 1999a). Social support, in terms of trust between colleagues, social team cohesion, recognition and respect by the direct supervisor, acts as a moderator in high strain jobs (high demands/low control) and alleviates stress responses.

Research shows that long-lasting high levels of job demands or chronic depletion of resources, in terms of low control and low social support, are both related to occupational stress (psychosomatic distress) and burnout, while increases in job resources were found to predict job satisfaction, work engagement and occupational well-being (Schaufeli et al, 2009). From that viewpoint, predictors and outcomes of occupational stress and well-being have to be taken into account in job related research.

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). *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. (Maslach & Jackson, 1981). *Psychosomatic distress* is a composite measure of occupational stress and consists of the sub-dimensions anxiety, depression and somatization. The latter is defined as the amount of somatic complaints, related to psychological distress (Adriaenssens, de Gucht, & Maes, 2012; Adriaenssens et al., 2015; Adriaenssens, De Gucht, Van Der Doef, & Maes, 2011). As a summary, occupational well-being can be defined as having high levels of job satisfaction and work engagement, resulting in learning, increase in skills and positive health outcomes, while occupational stress can be seen as having high levels of psychosomatic distress and burnout, resulting in negative health outcomes and turnover.

Occupational stress can ultimately lead to a variety of health related problems, with important consequences for the employee (e.g. coronary heart disease, hypertension, musculoskeletal problems), the organization he works in (e.g. sickness absence, turnover, loss of human capital) as for the entire society (e.g. increasing health cost, decrease in productivity) (Richardson & Rothstein, 2008). Figure 1 clarifies the above mentioned relationships

Although job characteristics, covered by the Job Demand Resources model, explain significant parts of variance of occupational well-being, interdisciplinary collaboration can also be a potential stressor. In the last decade, a number of studies emphasized the need of a supportive, high quality and mutually respectful cooperation between staff nurses and physicians (Rosenstein, 2002; Tang, Chan, & Liaw, 2013; Thomas, Sexton, & Helmreich, 2003). Interdisciplinary conflicts or tensions are found to be predictive of job dissatisfaction, turnover (intention) and burnout (Nelson, King, & Brodine, 2008; Tunc & Kutanis, 2009).

Figure 1: Theoretical model of the present study, based on the Job Demands-Resources model

1.3 Study aims & hypotheses

The objective of the present study is to analyze and describe relationships between job characteristics (job demands, job control, social support) and also interdisciplinary conflicts with physicians as potential predictors of occupational stress and well-being outcomes in first-line nurse managers. Based on previous research and developed models (see above), we hypothesized that a more positive perception of job demands (work/time pressure and physical demands) in first-line nurse managers is related to lower levels of occupational stress (H1); a more positive perception of job control (decision authority & skill discretion) in first-line nurse managers is related to lower levels of occupational stress (H2); a more positive perception of collaboration with doctors (e.g. less conflicts) in first-line nurse managers is related to lower levels of occupational stress (H3); and a more positive perception of social support in first-line nurse managers, coming from (middle)-management, colleague F-LNMs and staff members, is related to lower levels of occupational stress. (H4)

2 Methods

2.1 Study design and participants

This cross-sectional study was conducted in 2015 in 11 Belgian (Flemish) acute secondary hospitals. All first-line nurse managers (N = 481) working in these hospitals (all types of wards) were included. The eligible respondents needed to have direct responsibility over a team of staff nurses, having at least one year of experience. Interim first-line nurse managers were excluded. Of this sample, 318 first-line nurse managers (66.1% - range 54 - 81) agreed to take part in the research, which is an acceptable response rate in social sciences (Punch, 2003). An invitational letter, informed consent and an automatically generated access code to an online survey platform was distributed by an independent and neutral key-person in the hospital. Each respondent was asked to fill in the questionnaire individually in leisure time (e.g. at home,

during lunch time) or during work time. Two reminders were sent in the next two months. Only the authors had access to the online data.

2.2 Ethical considerations

Every potential respondent received an invitational letter from a key-person in the hospital, containing information on the study, an informed consent form and an automatically generated access code to an online survey platform. Data could only be related to a hospital and not to a person. As a consequence, researchers could not identify individuals. Key persons did not have access to raw data. This guaranteed confidentiality to the participants. The signed informed consent forms were obtained from the participants before data collection. Appropriate review board approval of the University of Antwerp was obtained for this study.

2.3 Measures

2.3.1 Predictors

Data were collected on socio-demographic status of each respondent, including age, gender, marital status, number of children, level of education, job time, and seniority.

The major part of work characteristics was measured by use of the Leiden Quality of Work Questionnaire (LQWQ) (Van Der Doef & Maes, 1999b) and the Leiden Quality of Work Questionnaire for Nurses (LQWQ-N) (Maes, Akerboom, Van Der Doef, & Verhoeven, 1999). The former is a generic questionnaire for occupational well-being while the latter is occupation-specific (for nurses). Both questionnaires can be used in its entirety or certain dimensions can be chosen to assess specific job related aspects. As tasks and responsibilities of first-line nurse managers are significantly different from staff nurses work, it was decided that the entire Leiden Quality of Work Questionnaire for Nurses could not be used for this specific population. We therefore selected 6 subscales of the generic Leiden Quality of Work Questionnaire that measure the job characteristics, based on the Job-Demand-Control-Support(JDCS)-model (work/time demands, physical demands, decision authority, skill discretion, social support from supervisor/ management and FLNM colleagues). Further, we used the predictor dimension 'nurse/doctor collaboration' and the two outcome-variables 'job satisfaction' and 'turnover intention' from the occupation-specific Leiden Quality of Work Questionnaire for Nurses. The factor structure of the Leiden Quality of Work Questionnaire and Leiden Quality of Work Questionnaire for Nurses were found to be stable and robust by means of factor analyses and reliability analyses (Van der Doef and Maes, 1999b; Gelsema et al., 2005). All items are formulated as statements, which have to be rated on a 4-point Likert scale, ranging from 'totally disagree' to 'totally agree'.

To measure the amount of perceived support from the staff nurses in the FLNM's team, this study applied one subscale of the Questionnaire on the Experience and Assessment of Work (QEAW) (Van Veldhoven, Meijman, Broersen, & Fortuin, 2002): '*social support from team members*'. The question has to be answered on a 4-point Likert scale, ranging from 'always' to 'never'.

The predictor variables are described in table 1. For each subscale the Cronbach's- α , the number of items and an item-example are given.

2.3.2 Outcomes

This study takes into account the following outcomes. *Job satisfaction* and *Turnover Intention* were taken from the Leiden Quality of Work Questionnaire for Nurses (see above). *Anxiety*, *depression* and *somatization* were taken from the validated Dutch version of the Brief Symptom Inventory (BSI) (De Beurs & Zitman, 2005). The Brief Symptom Inventory has shown adequate consistency, reliability and validity. The Brief Symptom Inventory gives a list of symptoms that have to be rated on a 5-point Likert scale ranging from 'not at all' to 'very much'. The sum score of these variables was used as a measure of *psychosomatic distress* ($\alpha = 0.85$, 19 items). *Work engagement* was measured by means of the Utrecht Work Engagement Scale (UWES) (Schaufeli & Bakker, 2010). The Utrecht Work Engagement Scale has shown adequate consistency, reliability and validity (Seppälä et al., 2008). The items of the Utrecht Work Engagement Scale are grouped into three subscales: Vigour, Dedication and Absorption. All items were scored on a 7-point Likert scale, ranging from 'never' to 'daily'. Only the sum score of the scale was used in the present study. High scores are indicative of engagement. *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, 2000). The Maslach Burnout Inventory consists of three dimensions: emotional exhaustion (EE), depersonalization (DP), and lack of personal accomplishment (PA). Items are scored on a 7-point Likert scale ranging from 'never' to 'always'. Only the weighted sum score of the three dimensions was used in this study ($0.4 \times EE + 0.3 \times DP + 0.3 \times \text{inversed-PA}$) (Ahola, Toppinen-Tanner, Huuhtanen, Koskinen, & Vänänen, 2009). A high score is indicative of burnout. The Maslach Burnout Inventory has shown adequate internal consistency, reliability and validity (Vanheule, Rosseel, & Vlerick, 2007).

The outcome variables are described in table 1. For each subscale the Cronbach's- α , the number of items and an item-example are given.

Table 1: Overview of variables used in the analysis of the present study

Dimension & scale	Items	Cronbach's α	Description & Item example
Work & Time Demands (LQWQ)	3 items	$\alpha = 0.83$	Mental job demands & time constraints. <i>"My job requires working very hard"</i>
Physical Demands (LQWQ)	4 items	$\alpha = 0.79$	Physical burden of work <i>'My job requires lots of physical effort'</i>
Skill Discretion (LQWQ)	4 items	$\alpha = 0.87$	Task variety and the extent, to which the job challenges one's skills. <i>'My job gives me the opportunity to develop my abilities.'</i>
Decision Authority (LQWQ)	4 items	$\alpha = 0.81$	Extent, to which first-line nurse managers have the freedom to act on what they know and the amount of decision authority they have over their work conditions. <i>'My job allows me to make a lot of decisions on my own.'</i>
Social Support from Supervisor/management (LQWQ)	4 items	$\alpha = 0.88$	Support given by the supervisor. <i>'My supervisor is helpful in getting the job done'</i>
Social Support from Colleague first-line nurse managers	4 items	$\alpha = 0.81$	Instrumental and emotional support given by colleague first-line nurse managers . <i>'I feel appreciated by my colleagues.'</i>

(LQWQ)			
Social support from team members' (QEAW)	8 items	$\alpha = 0.82$	Support given by staff of the FLNM's team. <i>'Is there a pleasant atmosphere between you and your staff members?'</i>
Nurse-Doctor Collaboration (LQWQ-N)	4 items	$\alpha = 0.70$	Jointly sharing information for decision making and problem solving between doctors & nurses. <i>'In my department, nurses and doctors work well together'.</i>
Job satisfaction (LQWQ-N)	3 items	$\alpha = 0.77$	The extent, to which first-line nurse managers are satisfied with their job. <i>'If I had to choose now, I would take this job again'</i>
Turnover intention (LQWQ-N)	3 items	$\alpha = 0.83$	The extent, to which first-line nurse managers have the intention to leave their current workplace or the job. <i>'I'm thinking about working in another hospital'</i>
Anxiety (BSI)	6 items	$\alpha = 0.85$	Level of unpleasant feelings of apprehensiveness: <i>'suddenly scared for no reason'</i>
Depression (BSI)	6 items	$\alpha = 0.80$	A state of mind with persistent low mood, absence of positive affect, and a range of associated emotional, cognitive and behavioral symptoms: <i>'feeling blue'</i>
Somatisation (BSI)	7 items	$\alpha = 0.81$	Level of experiencing and communicate psychological distress in the form of physical symptoms: <i>'pains in the heart or chest'</i>
Work engagement (UWES)	9 items	$\alpha = 0.92$	Sum score of subscales 'vigor', 'dedication' and 'absorption' <i>'At my work, I feel that I am bursting with energy.'</i>
Burnout (MBI-HSS)	9 items	$\alpha = 0.89$	Sum score of subscales 'emotional exhaustion', 'depersonalisation' and 'lack of personal accomplishment' <i>'I feel tired when I get up in the morning and have to face another day on the job'</i>

2.4 Statistical methods

The statistical software package for Windows, SPSS 23.0, was used to analyze the data. Descriptive statistics (means, standard deviations, skewness and kurtosis) were computed. Data, collected by the online survey, were transferred to an Excel file and in a second stage introduced in SPSS. Chi-square test and independent samples t-test were used to search for differences between subgroups. Pearson correlations were calculated between predictors and outcomes. Cronbach's alpha's for all variables were higher than .070 which is a sufficient score for the reliability of a psychometric test (Nunnally, 1978). Hierarchical regression analysis was performed to analyze the individual contribution of every predictor dimension of the theoretical model to the explained variance of the different outcomes, and estimates the strength of the association between socio-demographic characteristics (block-1), job demands (Work/time pressure & physical demands) (block-2), job control (decision authority and skill discretion) (block-3), staff nurse-doctor collaboration (block-4) and social support (supervisor/management, colleagues first-line nurse managers , staff/team) on the one hand and the outcome variables job satisfaction, turnover intention, work engagement, burnout and psychosomatic distress on the other hand. Because 10 predictors were entered in the regression analysis, at least a sample of 100 first-line nurse managers was required from a power perspective, as 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). Since our sample was three times larger, this study has enough statistical power. A p-value of 0.05 or lower was considered statistically significant.

3 Results

3.1 Personal characteristics

Almost 60% of the respondents were female and were on average 46 years old. More than 80% of them were married and had on average two children living with them. Almost 82% had a bachelor degree in nursing and 16% obtained a master degree. Four out of five first-line nurse managers obtained a supplementary degree in 'leadership in healthcare' after their bachelor degree. Almost 85% of the respondents worked full time and the sample had a mean seniority of 19 years from which on average 12 years as a FLNM. More detailed information can be found in table 2.

Table 2. Personal characteristics of the respondents

Personal characteristics	value
Age (years) <i>mean(range)</i>	45.7 (24-63)
Gender <i>female</i>	59.1%
Marital status <i>married & co-habiting</i>	82.7%
Children living with FLNM <i>none</i>	13.8%
1	11.6%
2	52.2%
3 or more	22.4%
Education degree <i>Qualified nurse</i>	2.5%
<i>Bachelor degree</i>	81.8%
<i>Master degree</i>	15.7%
Postgraduate course 'leadership in care'	82.1%
Job time <i>full-time</i>	85.8%
Seniority as a nurse <i>mean (SD)</i>	19.3 (10.1)
Seniority as FLNM <i>mean (SD)</i>	11.8 (8.7)

3.2 Correlations

Table 3. Pearson correlations and descriptive data of the continuous dependent and independent variables

	α	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1, age	—														
2, work/time pressure	0.83	-.006													
3, physical demands	0.79	-.050	.108												
4, Decision Authority	0.81	-.052	.137*	.203**											
5, skill discretion	0.87	-.069	-.213**	.120*	.320**										
6, collaboration doctors	0.70	-.027	.015	.042	.216**	.176**									
7, Social Support supervisor/management	0.88	-.127*	.169**	.157**	.295**	.199**	.116*								
8, Social Support colleagues first-line nurse managers	0.81	-.071	.006	.136*	.159**	.175**	.126*	.253**							
9, Social Support staff members/team	0.82	-.009	.109	.041	.191**	.115*	.247**	.150**	.211**						
10, Job satisfaction	0.77	-.002	.300**	.194**	.404**	.235**	.287**	.272**	.120*	.340**					
11, turnover intention	0.83	.166**	.138*	.054	.300**	.187**	.216**	.313**	.039	.180**	.553**				
12, psychosomatic distress	0.85	.035	-.229**	-.144*	-.328**	-.022	-.188**	-.232**	-.183**	-.323**	-.450**	-.310**			
13, work engagement	0.92	-.052	.069	.126*	.376**	.286**	.175**	.273**	.175**	.287**	.508**	.330**	-.386**		
14, burnout	0.89	-.016	-.324**	-.136*	-.329**	-.152**	-.222**	-.249**	-.193**	-.400**	-.626**	-.420**	.706**	-.604**	
M		45.7	1.88	3.00	2.78	3.37	2.14	2.92	2.90	2.15	2.90	3.21	0.35	4.22	1.42
SD		8.86	0.52	0.58	0.46	0.29	0.39	0.53	0.45	0.47	0.49	0.66	0.46	1.00	0.71
Range		39	2.00	3.00	2.75	1.88	2.00	3.00	3.00	2.40	2.83	3.00	3.38	4.56	4.40

The lower part of the table gives information about the mean (M), standard deviation (SD) and range for each variable. The first column shows the Cronbach Alpha for each construct. α = Cronbach Alpha; * $p < 0.05$; ** $p < 0.01$.

The correlations between predictors and outcomes in this sample are reported in table 3. All the correlations between the predictors were lower than .60 and variance inflation factor values did not exceed 1.25, implying there is no risk for multicollinearity (Field, 2000).

3.3 Regression

The results of the hierarchical analysis are reported in table 4. Results are given per block of variables. These variables are directly related to the hypotheses of this study.

Table 4. Linear regression results of the JDCS variables and collaboration with doctors versus the outcomes job satisfaction, psychosomatic distress, turnover intention, work engagement and burnout.

	Job Satisfaction		PsychoSom Distress		Turnover Intention		Work Engagement		Burnout	
	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β
Socio-demo.	0.01		0.01		0.03**		0.01		0.01	
Age		.04		.01		-.22***		.00		-.06
Gender		.02		-.05		-.05		.09		-.06
Job Demands	0.11***		0.08***		0.03*		0.02		0.12***	
W/T pressure		.25***		-.16**		-.10		.02		-.28***
Physical demands		.08		-.05		.04		.02		-.02
Job Control	0.15***		0.09***		0.11***		0.16***		0.09***	
Decision authority		.22***		-.26***		-.18***		.25***		-.17**
Skill discretion		.15**		.10		-.10		.15**		-.08
Collaboration	0.04***		0.02**		0.02**		0.01		0.02**	
Collabor.w. doctors		.15**		-.08		-.13**		.03		-.08
Social Support	0.05***		0.07***		0.06***		0.05***		0.9***	
Social Support management		.09		-.02		-.25***		.10		-.03
Social Support colleagues		-.02		-.01		.08		.02		-.02
Social Support staff/team		.21***		-.27***		-.08		.19***		-.31***
	R^2 mod. = .351		R^2 mod. = .251		R^2 mod. = .242		R^2 mod. = .238		R^2 mod. = .327	
	R^2 mod. adj.: 32.9%***		R^2 mod. adj.: 22.5%***		R^2 mod. adj.: 21.6%***		R^2 mod. adj.: 21.1%***		R^2 mod. adj.: 30.3%***	

W/T, work/time; β , beta; ΔR^2 , change in explained variance; mod., model; adj., adjusted; Sign., significance;

** $p < 0.01$; *** $p < 0.001$.

* $p < 0.05$;

The regression model for *job satisfaction* including only personal characteristics (block-1) was not significantly different from the null model. Job demands (block-2) explained 11% of variance with a more positive perception of work/time pressure being associated with higher levels of job satisfaction. Job control (block-3) added 15% of variance to the model. More positive perception of decision authority, as well as skill discretion, was related to higher levels of job satisfaction. Collaboration with doctors (block-4) explained an additional 4% of variance. A more positive perception of the collaboration with physicians was related to more job satisfaction. Finally, social support (block-5) added another 5% of variance. Only higher perceived social support from the team members was related to higher levels of job satisfaction. The final model explained 32.9% of variance in job satisfaction.

Concerning *psychosomatic distress*, the regression model including only personal characteristics (block-1) was not significantly different from the null model. Job demands (block-2) explained 8% of variance with better-perceived work/time pressure related to lower levels of psychosomatic distress. Job control (block-2) explained an additional 9% of variance. A more positive perception of decision authority was related to less psychosomatic distress. Collaboration with doctors (block-4) explained another 2% of variance but no significant relationship was found. Finally, social support (block-5) explained 7% of variance. A positive perception of social support from the staff members was found to be predictive of lower levels of psychosomatic distress. The final model explained 22.5% of variance in job satisfaction.

With regard to *turnover intention*, personal characteristics (block-1) explained 3% of variance. A rise in age was related to a decrease in turnover intention. Job demands (block-2) also explained 3% of variance. However, no variable was predictive. Job control (block-3) added 11% to explained variance. More positively perceived decision authority was related to lower levels of turnover intention. Collaboration with doctors (block-4) explained another 2% of variance. A more positive perception of the collaboration with physicians was related to lower levels of turnover. Finally, social support explained 6% of variance. More positively perceived social support from management was strongly related to lower levels of turnover intention. The final model explained 22% of variance in turnover intention.

The regression model for *work engagement* including only personal characteristics (block-1) was not significantly different from the null model. Job demands (block-2) did not explain additional variance in the model either. Job control (block-3) explained 16% of variance. A more positive perception of decision authority, as well as skill discretion was related to higher levels of work engagement. Collaboration with doctors (block-4) did not add additional explained variance to the model. Finally, social support (block-5) explained 5% of variance. Social support of staff members was positively related to work engagement. The final model explained 21.1% of variance in work engagement.

Regarding *burnout*, the regression model including only personal characteristics (block-1) was not significantly different from the null model. Job demands (block-2) explained 12% of variance. A more positive perception of work/time pressure was related to lower levels of burnout. Job control (block-3) added 9% of variance. A higher score on decision authority was related to lower levels of burnout. Collaboration with doctors (block-4) explained another 2% of variance but no significant relationship was found. Finally, social support (block-5) explained an additional 9% of variance. More positively perceived social support of staff members was related to lower levels of burnout. The final model explained 30.3% of variance in burnout.

4 Discussion

4.1 Key results

This study on predictors of occupational well-being in first-line nurse managers showed various relationships between predictors and outcomes. Explained variances of regression models predicting the outcome variables job satisfaction, psychosomatic distress, turnover intention, work engagement and burnout were 33%, 22.5%, 22%, 21%, 30% respectively. Taking into account that causes of occupational stress are multifactorial and that only a limited number of predictors is used in this study, this proportion of explained variance is very meaningful.

Regarding socio-demographics only one relationship was found: a rise in age was related to lower turnover intention. This is in line with previous research in nursing populations (Burke & Greenglass, 1999).

1 The job demand dimension, more specifically a positive perception of work/time demands, was
 2 significantly related to lower levels of psychosomatic distress and burnout, and to higher levels of job
 3 satisfaction but had no relationship with turnover intention. This can be explained by the fact that
 4 turnover intention is an end-stage in the Job Demand Resources model. These results are in line with
 5 previous research and confirm our first hypothesis (Bakker & Demerouti, 2007; Gelsema et al., 2006). This
 6 is an important finding as workload and time pressure in first-line nurse managers are reported as
 7 alarmingly high in previous studies (Van Bogaert et al, 2014; Udod & Care, 2013). Hospital managers have
 8 to take this into account to preserve their FLNM work force, by supporting first-line nurse managers
 9 logistically, e.g. providing assistance for administrative tasks or employing deputy first-line nurse
 10 managers as a backup. Physical demands however were not related to any outcome variable. This is
 11 obvious, as the job-content of first-line nurse managers is more and more evolved towards an
 12 organizational and administrative function, with less frequent heavy physical labor (i.e. the bedside
 13 nursing job).

14 As expected, based on previous studies in a broad range of professions and disciplines, the job control
 15 dimension was a strong predictor for every outcome variable (Haüsser et al., 2010; Van Der Doef & Maes,
 16 1999a; Gelsema et al., 2006). This finding confirms our second hypothesis. Giving employees more
 17 opportunities to decide themselves about parts of the job or give input in joint decisions is found to be
 18 related to higher levels of occupational well-being. Previous research in first-line nurse managers found
 19 adequate decision authority to be related to higher job satisfaction, and lower emotional exhaustion and
 20 turnover intention (Van Bogaert et al, 2014; Kath, Stichler & Ehrhart, 2012). This is important, as research
 21 showed that improvement of FLNM's opportunities of decision-making might increase their participation
 22 in implementing knowledge management (Hashemi Dehaghi, Sheikhtaheri, & Dehnavi, 2015). Decision
 23 authority/autonomy was found to be the most important buffer against stress (Kath, Stichler, & Ehrhart,
 24 2012). Johansson et al (2011) also found this and emphasize '*that first-line nurse managers are able to
 25 cope with high-demand job situations because of relatively high control over work*'.

26 Collaboration with doctors was positively related to job satisfaction and turnover intention. It is obvious
 27 that supportive cooperation, good communication and joint interdisciplinary decision making have a
 28 positive influence on the first-line nurse managers' satisfaction on the job and in a further stage can result
 29 in turnover. However, in contrast to previous studies in staff nurse populations, this collaboration does
 30 not seem to have an impact on development of occupational stress in first-line nurse managers
 31 (Rosenstein, 2002). Some researchers argue that the hierarchically comparable position of first-line
 32 nurse managers and physicians, which is different from the staff nurse-physician relationship, might
 33 explain this finding (Heeb & Haberey-Knuessi, 2014). Other studies explained this finding from the
 34 FLNM's level of assertiveness and hardiness (Judkins, Massey, & Huff, 2006; Suzuki et al., 2009).

35 Social support was also found to be predictive for occupational stress. In contrast to studies in staff-
 36 nurses, support from supervisor/management or colleagues first-line nurse managers in the hospital was

not predictive of the outcome variables, except for turnover intention (Gelsema et al., 2005). first-line nurse managers who do not perceive adequate support from their management have a significantly higher intention to leave their workplace. This finding confirms previous research and emphasizes the role of the management in retaining the FLNM workforce (Van Bogaert et al., 2014; Kath, Stichler & Ehrhart, 2012). On the other hand, support from the team was a strong predictor of all other occupational stress and well-being outcomes. This finding is new and literature to support it is sparse. The result of the present study might be explained by the fact that first-line nurse managers spend an important part of their job time with their teams as operational leaders while the contacts with other first-line nurse managers or with hospital management are more sporadic and often more formal, in terms of organizational meetings, briefings, consultations. The latter psychosocial contacts are found to be less supportive to counterbalance occupational stress (Lindholm, 2006; Lindholm, Dejin-Karlsson, Ostergren, & Uden, 2003). The core business of a FLNM is facilitating, engaging and steering a team to reach specific job- and team-oriented goals. Engaged and supported employees will be more likely to create a social context that is conducive to teamwork, respect and other important behaviors that may lead to organizational effectiveness and team spirit (Podsakoff, Whiting, Podsakoff, & Blume, 2009). However, first-line nurse managers also have to be aware that their team is not only a group they have to manage but also an important resource for their own occupational well-being. Consequently, it is valuable for themselves to invest in a positive relationship with their team members with mutual respect and understanding. Provision of social and instrumental support and adequate leadership by an FLNM to a team might result in getting back social support and appreciation from that team. The present study provides indeed evidence that this 'return on investment' is perceived as very important by first-line nurse managers to cope with the hassles and burden of their job.

Laschinger et al. (2015) state that authentic leadership can be identified as the extent to which staff nurses evaluate their leaders in terms of self-awareness, acting through moral–ethical perspectives, and using balanced and transparent processes (Laschinger, Borgogni, Consiglio, & Read, 2015). Authentic leadership showed a positive effect on areas of staff nurse's work life such as experience of workload, control, reward, fairness and values congruence. However, to what extent this authentic leadership has an impact on the quality of FLNM's work life or their ability to meet competing demands and values is yet unclear. The present study gives some evidence that support provided by their team has an important impact on their occupational well-being.

In a qualitative study investigating nurse manager's perception and experiences about staff nurse empowerment (Van Bogaert et al., 2015), nurse managers reported that the empowerment process of staff nurses had led to changes in the managers' roles as well as in daily practice dilemmas related to the leadership styles needed. The study concluded that clear organizational goals and dedicated support for both clinical nurses and nursing unit managers are imperative to maintaining an empowering practice environment, which can ensure the best care and healthy, engaged staff.

4.2 Strengths, imitations and future directions

The present study is not without limitations. Due to the cross-sectional design and the specific cultural, organizational and political context of study population's healthcare facilities the results must be interpreted with caution. An important strength however is that it reveals the specific protective value of social team support on occupational stress in first-line nurse managers. This is, to our knowledge, the first study that analyses and reports this finding. Future research in other settings and countries is needed to confirm the generalizability of this finding and should evaluate the effects of certain interventions designed to improve FLNM's performances with favorable impact on work related stress and well-being over time. Comparable measures or similar ones to those used here in longitudinal design will be beneficial. Furthermore, the impact of clinical practice setting (type of ward, type of clinical setting) has to be taken into account in future research as specific characteristics of these wards might influence relationships between predictors and outcomes of occupational stress and well-being in first-line nurse managers.

5 Conclusion

Our study confirmed the strength of the Job-Demand-Control-Support model to understand better the factors that influence occupational stress and well-being in particular roles such as FLNM. Social support from management was predictive of turnover intention. In contrast to other nursing disciplines, social support from colleagues was not predictive of occupational well-being in first-line nurse managers, while social support from the team members proved to be a strong predictor. Although future in-depth research is needed, this is an important finding, which has to be taken into account by hospital management. Creating a safe and supportive work environment for healthcare workers focusing on excellent patient outcomes and professional well-being is however a responsibility of all stakeholders such as executives, administrators, managers and staff nurses. Given the pivotal role of FLNM special attention for their development will be essential.

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