

International Journal of Occupational Safety and Ergonomics

ISSN: 1080-3548 (Print) 2376-9130 (Online) Journal homepage: http://www.tandfonline.com/loi/tose20

The role of burnout syndrome as a mediator for the effect of psychosocial risk factors on the intensity of musculoskeletal disorders: a structural equation modeling approach

Tahereh Gholami, Ahmad Heidari Pahlavian, Mahdi Akbarzadeh, Majid Motamedzade & Rashid Heidari Moghaddam

To cite this article: Tahereh Gholami, Ahmad Heidari Pahlavian, Mahdi Akbarzadeh, Majid Motamedzade & Rashid Heidari Moghaddam (2016) The role of burnout syndrome as a mediator for the effect of psychosocial risk factors on the intensity of musculoskeletal disorders: a structural equation modeling approach, International Journal of Occupational Safety and Ergonomics, 22:2, 283-290, DOI: 10.1080/10803548.2016.1147876

To link to this article: http://dx.doi.org/10.1080/10803548.2016.1147876

Published online: 14 Apr 2016.

Submit your article to this journal

Article views: 46

View related articles

View Crossmark data

Full Terms & Conditions of access and use can be found at
http://www.tandfonline.com/action/journalInformation?journalCode=tose20

Download by: [Majid Motamedzade] **Date:** 02 July 2016, At: 04:12

International Journal of Occupational Safety and Ergonomics (JOSE), 2016
Vol. 22, No. 2, 283–290, http://dx.doi.org/10.1080/10803548.2016.1147876

Taylor & Francis
Taylor & Francis Group

The role of burnout syndrome as a mediator for the effect of psychosocial risk factors on the intensity of musculoskeletal disorders: a structural equation modeling approach

Tahereh Gholami[a], Ahmad Heidari Pahlavian[b]*, Mahdi Akbarzadeh[b], Majid Motamedzade[b] and Rashid Heidari Moghaddam[b]

[a]*Fasa University of Medical Sciences, Iran;* [b]*Hamadan University of Medical Sciences, Iran;*

This study examined the hypothesis that burnout syndrome mediates effects of psychosocial risk factors and intensity of musculoskeletal disorders (MSDs) among hospital nurses. The sample was composed of 415 nurses from various wards across five hospitals of Iran's Hamedan University of Medical Sciences. Data were collected through three questionnaires: job content questionnaire, Maslach burnout inventory and visual analogue scale. Results of structural equation modeling with a mediating effect showed that psychosocial risk factors were significantly related to changes in burnout, which in turn affects intensity of MSDs.

Keywords: burnout syndrome; musculoskeletal disorders; structural equation modeling; psychosocial risk factors; Iran

Downloaded by [Majid Motamedzade] at 04:12 02 July 2016

1. Introduction

The healthcare professions, mainly nurses, are commonly considered to be at high risk of work-related stress and reduced welfare.[1] Nursing is often described as a stressful occupation due to the variety of everyday stressors such as conflicts with patients and their relatives, disagreements with management, differences of opinion with physicians, contact with suffering and possible death of patients. Nurses also have to do many physically demanding tasks such as transferring patients in and out of bed, lifting patients onto a bed and continually maintaining bent forward or twisted postures. These activities cause musculoskeletal disorders (MSD_S).[2,3] Trinkoff and Hignett recognized nursing as a physically demanding occupation.[3,4] Work-related musculoskeletal disorders (WMSDs) are prevalent among nurses with the highest rates of nonlethal injuries and illnesses involving days away from work. The nursing profession ranks second after industrial work, where physical workload is concerned. In this occupation, bending, twisting, sudden movements in non-neutral postures, manual handling and patient handling in particular are common.[5,6] Brown et al. [7] reported that injured nurses used an average of four sick days per injury and 20% of cases involved more than 20 days absent from work.

1.1. Burnout and psychosocial risk factors

In recent years, interest in the subject of burnout has increased since we have begun to realize the considerable negative influence that it has on employees, service consumers and organizations. Burnout is a psychological syndrome which appears after a prolonged exposure to psychosocial stressors.[8] Freudenberger introduced the theory of burnout in 1974 that described a state of weakness and annoyance among human service professionals. Emotional exhaustion (EE) (depletion of emotional resources), depersonalization (DP) (development of cynical attitudes towards the job or the recipients of the service) and perceptions of reduced personal accomplishment (PA) are dimensions of burnout syndrome.[8,9] The research carried out in Iran with regard to nurses' burnout shows that occupational burnout is a common phenomenon in this profession and many factors are associated with this event such as working environment conditions, work experience, work overload, job satisfaction, age, gender, education, authorities' support, general health, emotional intelligence, type of employment and working hours.[10,11] In spite of a general agreement on the three-dimensional definition of this syndrome, researchers do not always consider all three dimensions in their studies. Some research only considered emotional exhaustion as the core sign of burnout.[12] Other investigations focused only on exhaustion with depersonalization and disengagement without taking into account the personal accomplishment.[13,14]

The causes of burnout are more related to the psychosocial work environment such as work overload, low job social support, lack of job control, time pressure, lack of autonomy, too much direct patient contact, etc. rather than personal factors.[15–17]

*Corresponding author. Email: heidari_ms@yahoo.com

© 2016 Central Institute for Labour Protection – National Research Institute (CIOP-PIB)

Downloaded by [Majid Motamedzade] at 04:12 02 July 2016

In a study in Semnan, Iran, occupational burnout was reported moderate.[18] Burnout syndrome in the dimension of PA was reported high.[19] Emotional exhaustion (EE) and DP were reported moderate among hospitals' staffs;[20] and DP has been described as high in half of the nurses.[10] In another study, burnout was reported low in 31.2%; moderate in 67.5%; and high in 1.2% of nurses. Emotional exhaustion (EE) and DP were reported moderate, but lack of PA was reported high among working nurses in critical units.[21] Six studies investigating the relationship between staff burnout, personal well-being and behavior were reviewed by Skirrow and Hatton.[23] In spite of some limitations, almost all studies showed an association between staff burnout and outcomes such as job satisfaction, intention to leave the job, positive client interaction, general distress, depression and anxiety. Kozak et al. [24] identified factors that were predictive of personal burnout such as work–privacy conflict, emotional demands, role conflicts, job insecurity and feedback. More research is needed on the relationship between burnout and other outcome measures such as psychosocial risk factors and MSDs in order to develop macroergonomics intervention strategies aiming to improve the productivity as well as commitment of the nurses to work and the organization.

1.2. Psychosocial risk factors, burnout and MSDs

The term MSDs refers to a range of inflammatory and degenerative conditions that influence the muscles, joints, tendons, ligaments, peripheral nerves and supporting blood vessels with resulting pain or discomfort.[25,26] Da Costa and Vieira [5] reviewed risk factors of MSDs with at least a reasonable proof of a causal relationship to the development of WMSDs such as heavy physical work, smoking, high body mass index, high psychosocial work demands and the presence of co-morbidities. Grossi et al.,[27] Soares and Grossi,[28] Soares and Jablonska,[29] Honkononen et al. [30] and Toppinen-Tanner et al. [31] investigated the association between musculoskeletal complaints and burnout syndrome as a psychosocial factor.

The current study assumes that burnout syndrome results from psychosocial risk factors. Furthermore, the intensity of MSDs is factored into the analysis of burnout syndrome. Also this study considers burnout level as a mediator variable to explain the relationship between the independent and dependent variables without affecting the direction and/or strength of the relationship between these variables. The mediating role of burnout between work-related factors and musculoskeletal complaints among hospital nurses was confirmed by Jaworek et al.[32] Bongers et al. [33,34] suggested the association of work-related factors and musculoskeletal complaints through the mediation of stress, which can be the predictor of burnout syndrome. Larsman et al.,[35] Kjellberg and Wadman,[36] and Wadman and Kjellberg [37] investigated in this field, too.

The present study aims to investigate the relationship between psychosocial risk factors and intensity of MSDs in different body regions through the mediating effect of three burnout syndrome dimensions.

2. Materials and methods

2.1. Study subjects

In this cross-sectional study conducted between February and May 2013, data were collected via unnamed questionnaires. A random sample of 415 male and female nurses from five hospitals out of 888 nurses was selected to participate in this investigation.

Psychosocial risk factors, burnout and intensity of MSDs were measured with the job content questionnaire (JCQ), Maslach burnout inventory and visual analogue scale, respectively.

2.2. Data gathering methods and tools

A Persian version [38] of Karasek and Theorell's job content questionnaire (P-JCQ) was used to evaluate the psychosocial risk factors through the five dimensions: psychological job demands (five questions), decision latitude (nine questions), social support (eight questions), physical job demand (five questions) and job insecurity (three questions). Each of the questions had a 4-point response ranging from '1 = *strongly disagree*' to '4 = *strongly agree*'. In some cases, fewer than four responses were provided such as in physical hazards and exposure questions; while in some cases more than four responses were provided such as in social support questions. The scale calculations were performed in accordance with the JCQ's user's guide.[39]

Calculated Cronbach's α in this investigation for five dimensions of JCQ were: decision latitude = 0.52; psychological job demands = 0.60; social support = 0.87; physical job demand = 0.80; and job insecurity = 0.43.

A Persian version [40] of the three dimensions of the Maslach burnout inventory was used to evaluate burnout among nursing personnel: EE, PA and DP. The questionnaire includes 22 questions: nine for the EE dimension, eight for PA and five for DP. Each question of the Maslach burnout inventory is scored on a 7-point scale according to how often it is experienced, from 0 = *never* to 6 = *every day*. Calculated Cronbach's α in this investigation for three dimensions of the Maslach burnout syndrome questionnaire were EE = 0.85; DP = 0.80; and PA = 0.75. Cut-off points for each of the subscales are shown in Table 1.

Intensity of MSDs in different body regions was measured by the visual analogue scale. The scale not only divided the body into left and right sides but also, it estimates the severity of each painful region perceived by

Table 1. Cut-off point of Maslach burnout subscales.

	Intensity of burnout		
Burnout subscales	High	Moderate	Low
Emotional exhaustion	> 27	17–26	0–16
Depersonalization	> 13	7–12	0–6
Personal accomplishment	0–31	32–38	> 39

nursing through a continuous line between two end points from 0 to 10.

2.3. *Statistical analysis*

In order to examine the relationship between psychosocial risk factors and intensity of MSDs through the mediating role of burnout syndrome, a structural equation modeling (SEM) analysis was performed using LISREL version 8.3. Input data to SEM consisted of the raw data that was stored in SPSS version 16. Two models were tested: with burnout and without burnout syndrome. In both models, psychosocial risk factors were independent latent variables with intensity of MSDs serving as the dependent latent variable. In the second model, burnout syndrome was the mediating variable. When analyzing structural equation models, the main point is whether the model fits to the hypothesized degree or not; in other words, does it sufficiently describe the sample data or not. A number of fit indices were considered in compliance with the classification of recommended fit indices.[41] The χ^2 value statistic is a goodness-of-fit measure that assesses the extent of the difference between the observed covariance matrix and the fitted covariance matrix.[42] The χ^2 value statistic could be regarded as a measure of overall fit of the model to the data. A large statistically significant value relative to the degrees of freedom points has poor model fit out.[43] Hu and Bentler [42] proposed that the χ^2 value statistic is sensitive to sample size, and with a large sample size even small differences may result in the rejection of the specified model.

The normed χ^2 measure is a proportion of the χ^2 value to its degrees of freedom, where ratios in the range of 2 to 1 are indicative of an acceptable fit between the supposed model and the sample data. Values below 1 show an 'over fitted' model,[41] and values larger than 2, or the more liberal limit of 5, specify that the model does not fit the observed data and needs improvement. However, there is no agreement on what accurately represents a good fit.[44] Browne and Cudeck [45] proposed that the root mean square error of approximation (RMSEA) is a measure of the difference per degree of freedom for the model, and values of about 0.05 or less show a close fit of the model to the data and values of about 0.08 or less indicate a sensible error of approximation.

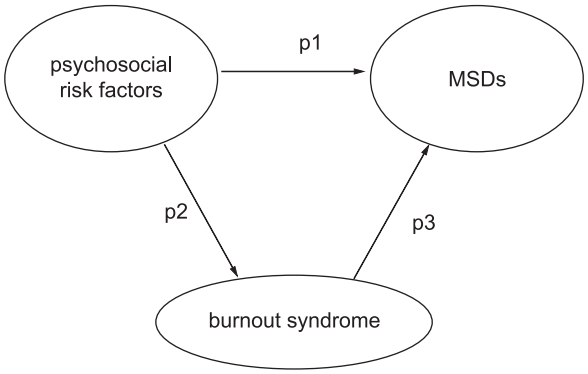


Figure 1. Specification of the full structural equation model tested in this study, with the mediating effect of burnout.
Note: p = paths (regression weights), MSDs = musculoskeletal disorders.

2.4. *Model specification (SEM)*

The model consists of the independent latent variables (psychosocial risk factors) and the dependent latent variable (intensity of MSDs). The support for the recommended covariance and path relationships in the structural model is justified by previous research findings. We hypothesize that psychosocial risk factors are positively associated with intensity of MSDs (p1). A full structural model used in the study is presented in Figure 1. This process model consists of the independent latent variables like psychosocial risk factors and burnout, which are treated as the mediating variable and intensity of MSDs, which are considered as a dependent variable. Consistent with the first model, psychosocial risk factors are hypothesized to be positively associated with intensity of MSDs (p1) and burnout (p2). Finally, burnout is hypothesized to be positively related to intensity of MSDs (p3).

3. Result

The demographic features of the studied population are shown in Table 2. The majority of the respondents were females (82.7%). The average age of the participants was 31.93 years ($SD = 6.13$), ranging between 21 and 58 years. The average job tenure of the nursing personnel was 7.68 years ($SD = 5.39$), ranging between 1 and 34 years.

As shown in Table 2, the majority of the nursing personnel had a BSc degree (91.3%). According to the employment contracts, the working schedule for 87.9% of nursing personnel was shift work. As can be seen in Table 3, nurses who participated in the study reported high scores in EE (44.8%), high scores in DP (12.3%) and 36% had low PA. If we consider the high levels of EE, DP and decreased PA, the total burnout among nurses experiencing severe burnout is 8.67%.

The mean, standard deviation, and minimum and maximum of dimensions of occupational stress are provided in Table 4. In this table, if the mean score of decision latitude and social support were high, it indicates lower stress;

Downloaded by [Majid Motamedzade] at 04:12 02 July 2016

Table 2. Demographic characteristics and psychosocial risk factors of nursing ($N = 415$).

Variable	M (SD)	Range
Age (years)	31.93 (6.13)	21–58
Job tenure (years)	7.68 (5.39)	1–34
Variable	n (%)	
Gender		
Female	343 (82.7)	
Male	72 (17.3)	
Marital status		
Single	193 (46.5)	
Married	222 (53.5)	
Education		
Associate diploma	36 (8.7)	
BSc	379 (91.3)	
Working schedule		
Shifts	344 (87.9)	
Fixed	71 (17.1)	
Second job		
Yes	5 (1.2)	
No	410 (98.8)	

and if the mean score of psychological and physical job demands, and job insecurity were high, it indicates higher stress. It should be explained that for determining the high or low score in each dimension, the mean score *is* compared with the attainable range score. Accordingly, as seen the mean score of decision latitude is high and the mean score of job insecurity is low, which indicates low stress. On the other hand, the mean score of psychological and physical job demand is high and the mean score of social support is low, which indicates high stress.

Average intensity of MSDs is shown in Table 5. The most common painful regions among the nurses were lower back (5.43), left foot (5.08), head and neck (4.43), right foot (4.90), right knee (3.84) and left knee (3.74). The lowest pain was reported to be in the right and left elbows (1.99 and 1.91, respectively).

3.1. *Test of hypothesis*

Structural equation modeling (SEM) analysis using LISREL was performed to test the mediation effect. Both models, with and without the burnout syndrome variable, were tested. Seven items from the list of MSDs were focused upon: head and neck, right shoulder, lower back, right knee, left knee, right foot and left foot disorders. This

Table 4. Mean, standard deviation, minimum and maximum of dimensions of occupational stress ($N = 415$).

Psychosocial risk factor	M (SD)	Range	Range attainable score [39]
Psychological job demand	38.14 (5.17)	26–48	12–48
Decision latitude	64.40 (7.04)	46–88	24–96
Physical job demand	16.02 (2.51)	10–20	5–20
Social support	22.73 (3.55)	12–40	8–48
Job insecurity	7.61 (3.84)	3–17	3–17

Table 5. The intensity of musculoskeletal disorders in various body regions ($I = 415$).

Body region	Intensity of pain, M (SD)
Head and neck	4.43 (3.26)
Right shoulder	2.90 (3.14)
Left shoulder	2.79 (3.08)
Lower back	5.43 (3.14)
Right elbow	1.99 (2.61)
Left elbow	1.91 (2.45)
Right hand	2.20 (2.70)
Left hand	2.21 (2.63)
Hip	2.13 (2.66)
Right knee	3.84 (3.19)
Left knee	3.74 (3.28)
Right foot	4.90 (3.23)
Left foot	5.08 (3.32)

was because these regions achieved the highest pain compared to the other regions of the body within the model. The independent variables in both models were psychosocial risk factors. The present study had no internal missing values.

3.2. *Psychosocial risk factors and intensity of MSD model*

Structures for relationships between the psychosocial risk factors and intensity of MSDs were specified and analyzed. The standardized path coefficients for the model are reported in Figure 2. The structural model with no mediator (see Figure 2) did not show a good fit to the data ($\chi^2 = 148.78$; $df = 43$; $p < 0.001$; normed $\chi^2 = 3.46$; RMSEA = 0.15). All paths (factor loadings)

Table 3. Prevalence of burnout in nurses ($N = 415$).

Burnout syndrome dimensions	M (SD)	High (%)	Moderate (%)	Low (%)
Emotional exhaustion	25.13 (12.42)	186 (44.8%)	106 (25.5%)	123 (29.6%)
Depersonalization	5.91 (5.12)	51 (12.3%)	101 (24.3%)	263 (63.4%)
Personal accomplishment	33.30 (9.59)	159 (38.3%)	105 (25.3%)	151 (36.4%)

Downloaded by [Majid Motamedzade] at 04:12 02 July 2016

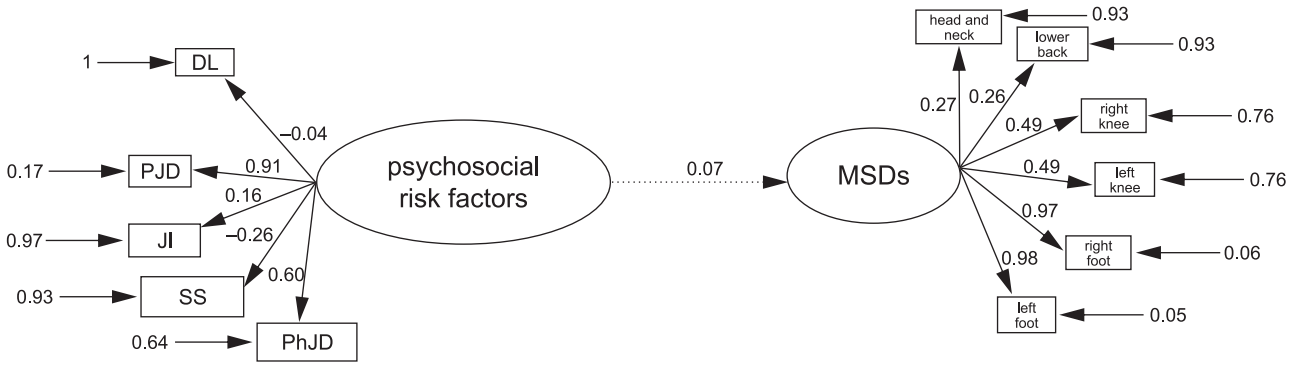


Figure 2. Structural equation model with no mediator among nursing personnel ($N = 415$).
Note: Measurement and structural components with standardized estimates; DL = decision latitude, PJD = psychological job demand, JI = job insecurity, SS = social support, PhJD = physical job demand, MSDs = musculoskeletal disorders. The non-significant paths are marked as dotted lines.

Downloaded by [Majid Motamedzade] at 04:12 02 July 2016

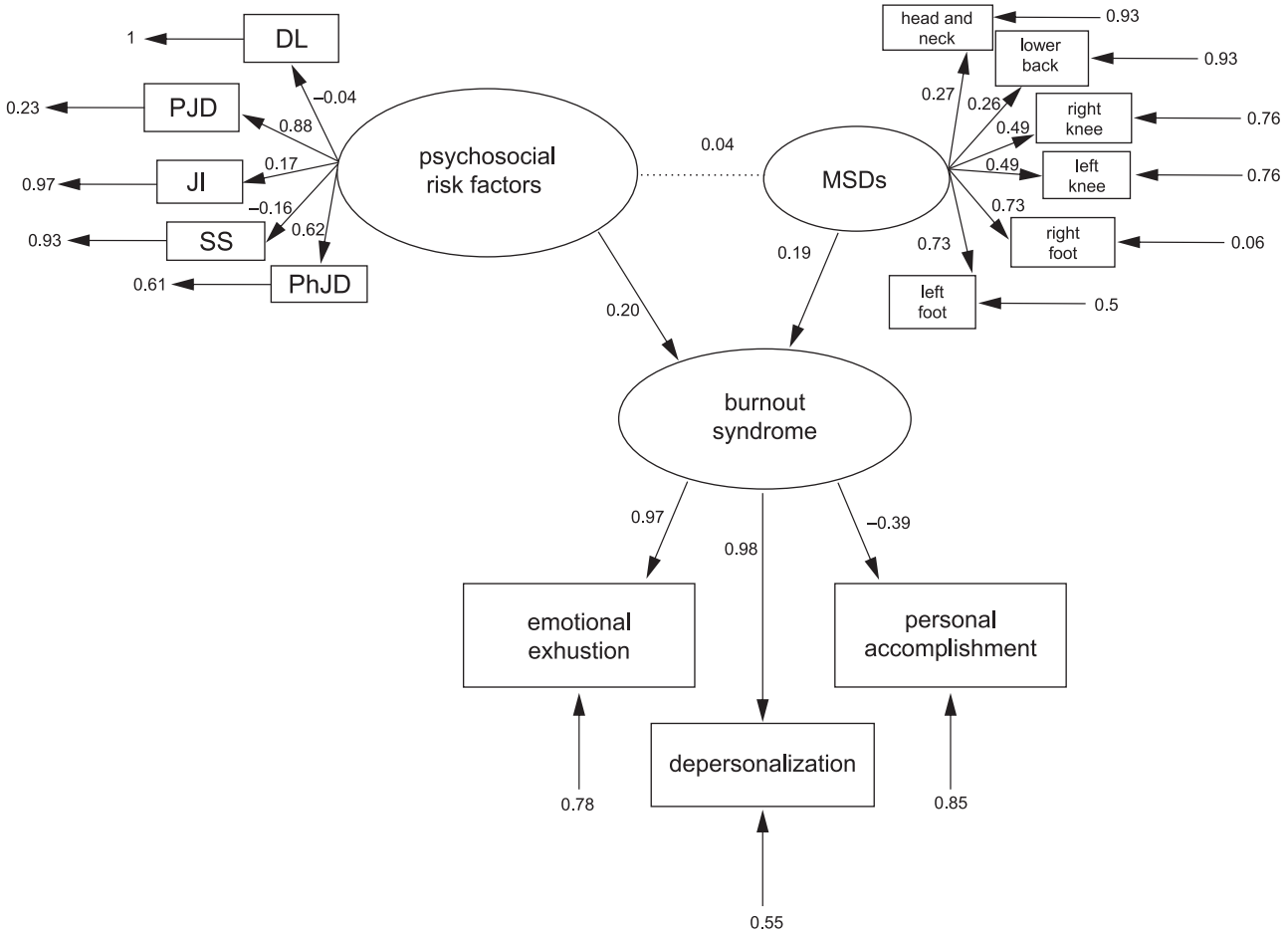


Figure 3. Full structural equation model with burnout as mediator among nursing personnel ($N = 415$).
Note: Measurement and structural components with standardized estimates; DL = decision latitude, PJD = psychological job demand, JI = job insecurity, SS = social support, PhJD = physical job demand, MSDs = musculoskeletal disorders. The non-significant paths are marked as dotted lines.

in the measurement models were significant. In the structural part, the path between psychosocial risk factors and intensity of MSDs was not significant in the expected direction.

3.3. Psychosocial risk factors, burnout and intensity of MSD model

The second proposed model, i.e., the full structural model with a mediator (see Figure 3) demonstrated a good

model fit ($\chi^2 = 139.86$; $df = 74$; $p < 0.001$; normed $\chi^2 = 1.89$; RMSEA = .04). All paths in the measurement models were significant including the measurement model of the mediator. In the structural part, two out of three paths were significant and in the expected direction. In accordance with the first structural model, the path between psychosocial risk factors and intensity of MSDs was not significant. Psychosocial risk factors were significantly related to burnout, which means that psychosocial risk factors (statistically) predicted high scores in the latent variable (burnout). Furthermore, burnout was significantly related to intensity of MSDs – in the expected direction. In sum, psychosocial risk factors were significantly related to changes in burnout, which in turn affected the intensity of MSDs.

4. Discussion

The main objective of this study was to examine the relationship between psychosocial risk factors and intensity of MSDs through the mediating effect of burnout syndrome in a sample of Iranian nurses. Prior to examining this relationship, psychosocial risk factors, burnout syndrome and intensity of MSDs in this Iranian sample were investigated.

Some researchers in their studies have used two or three dimensions of JCQ, but the current study has investigated the five main dimensions of JCQ: decision latitude, social support, psychosocial job demand, physical job demand and job insecurity. Mean and standard deviation of these five dimensions that can be seen in Table 4 are approximately similar with results of Choobineh et al. [38] and Li et al. [46] in two dimensions: decision latitude and social support. However, psychosocial job demands were different from Choobineh et al.'s [38] study.

Burnout syndrome in numerous domestic and foreign researches is reported differently. The results of this study on the EE subscale are similar to the results of other studies conducted in Iran,[47] Saudi Arabia,[48] Shanghai [49] and Spain;[50] they are different from the Kilfedder et al. [51] study in the UK. In contrast to these studies, the findings of this study in the DP subscale are consistent with Kilfedder et al.'s [51] study in the UK. Heidari Pahlavian and Mahjub [52] in 2011, with the same population, reported that the mean score was 18.78 (11.54) for the EE subscale, 5.99 (6.26) for the DP subscale and 19.88 (4.66) for the PA subscale. Therefore, it may be concluded that Iranian nurses experienced a relatively high level of burnout in their occupational life.

In this cross-sectional study, we found high severity of MSDs not only for back pain but also for head and neck, right knee, left knee, right foot and left foot. Studies have reported that MSDs are particularly common in healthcare workers who are in direct contact with patients.[53] The high prevalence of MSDs among nurses is considered to be due to physical work demands, as well as work organizational factors, of which scheduling is an important factor.[54] Hignett [55] reported that low back pain was one of the most important WMSDs among nursing professionals, accounting for a point prevalence of approximately 17%, an annual prevalence of 40–50% and a lifetime prevalence of 35–80%.

Generally, the results of the SEM process supported the hypothesis concerning the mediating role of burnout syndrome in relation to psychosocial risk factors and intensity of MSDs. Psychosocial risk factors had indirect effects on intensity of MSDs through burnout syndrome. As such, there is relatively limited data to compare it directly with.

Jaworek et al. [32] also showed that work stimuli and work demands had indirect and direct effects on musculoskeletal complaints through mediating effects of burnout syndrome. Kjellberg and Wadman [36] showed this effect in a study that examined relationships between psychosocial risk factors and musculoskeletal complaints. This mediating effect of psychosocial risk factors was not confirmed in the current study as in the study by Kjellberg and Wadman; different occupational groups participated in that study. It should be emphasized that in the present study the intensity of MSDs was measured rather than the prevalence of musculoskeletal complaints. It is remarkable that other researchers have used prevalence of MSDs in their modeling studies.[32,35,36] Almost certainly, due to this reason in this modeling study no significant, strong or direct relation was found between psychosocial risk factors and MSDs.

Burnout syndrome mediates the relationship between psychosocial risk factors and intensity of MSDs. Figure 2 shows that the direct relationships between psychosocial risk factors and burnout, direct relationships between burnout syndrome and intensity of MSDs lead to an indirect relationship between psychosocial risk factors and intensity of MSDs. It is noteworthy that a study that examines the relationship between job content dimensions and severity of MSDs with mediating role of burnout syndrome was not found. However, the associations of work demands with musculoskeletal complaints and burnout syndrome were investigated in other studies.[25,47,49]

It can be concluded that lack of attention to burnout syndrome and psychosocial risk factors leads to MSDs – one of the most common occupational diseases. Therefore, it is necessary that similar but not cross-sectional investigations, using other methods than questionnaires, be conducted among other professions.

Acknowledgements

The authors are grateful for the motivation and honesty of the nurses who participated in this study.

Disclosure statement

No potential conflict of interest was reported by the authors.

Downloaded by [Majid Motamedzade] at 04:12 02 July 2016

Funding

This work was supported by Research Deputy of Hamadan University of Medical Sciences.

References

[1] Shimizu T, Mizoue T, Kubota S, et al. Relationship between burnout and communication skill training among Japanese hospital nurses: a pilot study. J Occup Health. 2003;45(3):185–190.
[2] Smith DR, Mihashi M, Adachi Y, et al. A detailed analysis of musculoskeletal disorder risk factors among Japanese nurses. J Safety Res. 2006;37:195–200.
[3] Trinkoff AM, Lipscomb JA, Geiger-Brown J, et al. Perceived physical demands and reported musculoskeletal problems in registered nurses. Am J Prev Med. 2003;24(3):270–275.
[4] Hignett S. Using computerized OWAS for postural analysis of nursing work. In: Robertson SA, editor. Contemporary ergonomics. Proceedings of the Ergonomics Society's 1994 annual conference. London: Taylor & Francis; 1994. p. 253–258.
[5] da Costa BR, Vieira ER. Risk factors for work-related musculoskeletal disorders: a systematic review of recent longitudinal studies. Am J Ind Med. 2010;53(3):285–323.
[6] Engels JA, Landeweerd JA, Kant Y. An OWAS-based analysis of nurses' working postures. Ergonomics. 1994;37(5):909–919.
[7] Brown JG, Trinkoff A, Rempher K, et al. Nurses' inclination to report work related injuries: organizational, work-group and individual factors associated with reporting. AAOHN J. 2005;53(5):213–7.
[8] Maslach C, Schaufeli WB, Leiter MP. Job burnout. Annu Rev Psychol. 2001;52:397–422.
[9] Demir A, Ulusoy M, Ulusoy MF. Investigation of factors influencing burnout levels in the professional and private lives of nurses. Int J Nurs Stud. 2003;40:807–27.
[10] Khazaei I, Khazaei T, Sharifzadeh Gh. Nurses professional burnout and some predisposing factors. Birjand Univ Med J. 2006;9:57–62.
[11] Khodabakhsh MR, Mansuri P. Analysis and comparison between frequency and depth of job-burnout aspects among male and female nurses. Iran J Nurs Midwifery Res. 2011;13:40–2.
[12] Stordeur S, D'hoore W, Vandenberghe C. Leadership, organizational stress, and emotional exhaustion among hospital nursing staff. J Adv Nurs. 2001;35(4):533–542.
[13] Büssing A, Glaser J. Four-stage process model of the core factors of burnout: the role of work stressors and work-related resources. Work Stress. 2000;14(4):329–346.
[14] Demerouti E, Bakker AB, Nachreiner F, et al. A model of burnout and life satisfaction amongst nurses. J Adv Nurs. 2000;32(2):454–464.
[15] Imai H, Nakao H, Tschiya M, et al. Burnout and work environments of public health nurses involved in mental health care. Occup Environ Med. 2004;61:764–768.
[16] Sibbald B, Bojke C, Gravelle H. National survey of job satisfaction and retirement intentions among general practitioners in England. BMJ. 2003;326:22.
[17] Visser M, Smets E, Oort F, et al. Stress, satisfaction and burnout among Dutch medical specialists. CMAJ. 2003;168:271–5.
[18] Neamat SA, Hooshang BA. Occupational exhaustion and its related factors in nurses and midwives of Semnan University of Medical Sciences. Sci J Kurdistan Univ Med Sci. 2006;11:77–83.
[19] Payami M. Evaluation of burnout in nurses working in Zanjan university hospitals. Iran Nurs J. 2002;34:32–33.
[20] Talaei A, Mokhber N, Mohamadnejad M, et al. Burnout its ralated factors in staffs of university hospitals in Mashhad. Semnan Univ Med J. 2007;9:237–245.
[21] Payami M. Evaluation social support and its relationship with burnout in intensive care nurses. J Zanjan Univ Med Sci. 2000;9:26–30.
[22] Toubaei SH, Sahraeian A. Burnout and job satisfaction of nurses working in internal, surgery, psychiatry burn and burn wards. Horizon Med Sci. 2007;12:40–45.
[23] Skirrow S, Hatton C. 'Burnout' amongst direct care workers in services for adults with intellectual disabilities: a systematic review of research findings and initial normative data. J Appl Res Intellect Disabil. 2007;20:131–144.
[24] Kozak A, Kersten M, Schillmöller Z, et al. Psychosocial work-related predictors and consequences of personal burnout among staff working with people with intellectual disabilities. Res Dev Disabil. 2013;34:102–115.
[25] Punnett L, Wegman DH. Work-related musculoskeletal disorders: the epidemiologic evidence and the debate. J Electromyogr Kinesiol. 2004;14:13–23.
[26] Smith DR, Leggat PA. Musculoskeletal disorders in nursing. Aust Nurs J. 2003;11(19–21).
[27] Grossi G, Soares JJF, Ängeslevä J, et al. Psychosocial correlates of longterm sick-leave among patients with musculoskeletal pain. Pain. 1999;80:607–620.
[28] Soares JJF, Grossi G. Psychosocial factors, pain parameters, mental health and coping among Turkish and Swedish patients with musculoskeletal pain. Scand J Occup Ther. 1999;6:174–183.
[29] Soares JJF, Jablonska B. Psychosocial experiences among primary care patients with and without musculoskeletal pain. Eur J Pain. 2004;8:79–89.
[30] Honkononen T, Ahola K, Pertovaara M, et al. The association between burnout and physical illness in the general population – results from Finnish Health 2000 Study. J Psychosom Res. 2006;61:59–66.
[31] Toppinen-Tanner S, Ojajärvi A, Väänänen A, et al. Burnout as a predictor of medically certified sick-leave absences and their diagnosed causes. Behav Med. 2005;31: 18–32.
[32] Jaworek M, Marek T, Karwowski W, et al. Burnout syndrome as a mediator for the effect of work-related factors on musculoskeletal complaints among hospital nurses. Int J Ind Ergon. 2010;40:368–375.
[33] Bongers PM, de Winter CR, Kompier MAJ, et al. Psychosocial factors at work and musculoskeletal disease. Scand J Work Environ Health. 1993;19:297–312.
[34] Bongers PM, Kremer AM, ter Laak J. Are psychosocial factors, risk factors, for symptoms and signs of the shoulder, elbow, or hand/wrist?: a review of the epidemiological literature. Am J Ind Med. 2002;41:315–342.
[35] Larsman P, Sandsjö L, Klipstein A, et al. Perceived work demands, felt stress, and musculoskeletal neck/shoulder symptoms among elderly female computer users. The NEW study. Eur J Appl Physiol. 2006;96:127–135.
[36] Kjellberg A, Wadman C. The role of the affective stress response as mediator of the effect of psychosocial risk factors on musculoskeletal complaints-part 1: assembly workers. Int J Ind Ergon. 2007;37:367–374.
[37] Wadman C, Kjellberg A. The role of the affective stress response as a mediator for the effect of psychosocial risk factors on musculoskeletal complaints – part 2: hospital workers. Int J Ind Ergon. 2007;37:395–403.
[38] Choobineh A, Ghaem H, Ahmedinejad p. Validity and reliability of the Persian (Farsi) version of the job content

Downloaded by [Majid Motamedzade] at 04:12 02 July 2016

questionnaire: a study among hospital nurses. East Mediterr Health J. 2011;17(4):335–41.
[39] Karasek RA. Job content questionnaire and user's guide. Lowell (MA): Department of Work Environment, University of Massachusetts; 1985.
[40] Akbari R, Ghafar Samar R, Kiany G-R, et al. Factorial validity and psychometric properties of Maslach burnout inventory – the Persian version. Knowledge and Health Journal. 2011;6(3):1–8.
[41] Schumacker RE, Lomax RG. A beginner's guide to structural equation modeling. Mahwah (NJ): Erlbaum; 1996.
[42] Hu LT, Bentler PM. Evaluating model fit. In: Hoyle RH, editor. Structural equation modeling concepts, issues, and applications. London: Sage; 1995. p. 76–99.
[43] Jöreskog K, Sörbom D. LISREL 8: structural equation modeling with the SIMPLIS command language. Mahwah (NJ): Erlbaum; 1993.
[44] Bollen K. Structural equations with latent variables. New York: Wiley; 1989.
[45] Browne MW, Cudeck R. Alternative ways of assessing model fit. In: Bollen KA, Long JS, editor. Testing structural equation models. Newbury Park (CA): Sage; 1993. p. 136–62.
[46] Li J, Yang W, Liu P, et al. Psychometric evaluation of the Chinese (Mainland) version of job content questionnaire: a study in university hospitals. Ind Health. 2004;42:260–267.
[47] Rahmani F, Behshid M, Zamanzadeh V, et al. Relationship between general health, occupational stress and burnout in critical care nurses of Tabriz teaching hospitals. Iran J Nurs Midwifery Res. 2010;23(66):54–63.
[48] Al-Turki HA, Al-Turki RA, Al-Dardas HA, et al. Burnout syndrome among multinational nurses working in Saudi Arabia. Ann Afr Med. 2010;9(4):226–229.
[49] Xie Z, Wang A, Chen B. Nurse burnout and its association with occupational stress in a cross-sectional study in Shanghai. J Adv Nurs. 2011;67(7):1537–1546.
[50] Iglesias MEL, Vallejo RBdB, Fuentes PS. The relationship between experiential avoidance and burnout syndrome in critical care nurses: a cross-sectional questionnaire survey. Int J Nurs Stud. 2010;47:30–37.
[51] Kilfedder C, Power K, Wells T. Burnout in psychiatric nursing. J Adv Nurs. 2001;34(3):383–396.
[52] Heidari Pahlavian A, Mahjub H. Prevalence and correlates of depression in Hamedan Province, Iran. Paper presented at: The 12th European Congress of Psychology; 2001 Jul 6; Istanbul.
[53] Lipscomb J, Trinkoff A, Brady B, et al. Health care system changes and reported musculoskeletal disorders among registered nurses. Am J Public Health. 2004;94(8):1431–1435.
[54] Hui L, Ng G, Yeung S, et al. Evaluation of the physiological work demands and low back neuromuscular fatigue on nurses working in geriatric wards. Appl Ergon. 2001;32(5):479–483.
[55] Hignett S. Work-related back pain in nurses. J Adv Nurs. 1996;23:1238–1246.

Downloaded by [Majid Motamedzade] at 04:12 02 July 2016