

Evaluation of Work-related Psychosocial and Ergonomics Factors in Relation to Low Back Discomfort in Emergency Unit Nurses

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ABSTRACT

Background and Aim: High prevalence of low back pain is one of the most common problems among nurses. The aim of this study was to evaluate the relation of the intensity of low back discomfort to two low back pain contributor factors (Ergonomics risk factors and psychosocial factors).

Methods: This cross-sectional survey was conducted on 120 emergency unit nurses in Esfahan. Job content, ergonomics hazards and nordic questionnaire were used in that order for daily assessment of Psychosocial and Ergonomics factors and the intensity of low back discomfort. Nurses were questioned during a 5-week period, at the end of each shift work. The final results were analyzed with SPSS software18/PASW by using Spearman, Mann-Whitney and Kolmogorov-Smirnov test.

Results: There was a significant relationship between work demand, job content, social support and intensity of low back discomfort (P value <0.05). But, there was not any link between intensity of low back discomfort and job control. Also, there was significant relationship between intensity of low back discomfort and ergonomics risk factors.

Conclusion: This study showed an indirect relationship between the intensity of low back discomfort and social support. This study also confirmed a direct relationship between the intensity of low back discomfort and work demand, job content, ergonomics factors (Awkward Postures (rotating and bending), manual patient handling and repetitiveness, standing continuously more than 30 min). So, to decrease work related low back discomfort, psychosocial factors should be attended in addition to ergonomics factors.

Keywords: Emergency unit nurses, ergonomics factors, low back pain, work-related psychosocial factors

INTRODUCTION

Low back pain (LBP) is one of the most common occupational health problems and accounts for a large number of compensation days and disability for workers.^[1,2,3] It is particularly common among nurses.^[4-6]

Extensive research into the role of occupational risk factors in the development of low back pain has been carried out.^[7,8,9]

Low back pain is caused by multiple factors, generally categorized into physical, psychosocial and lifestyle factors.^[10] Psychosocial factors at work have been shown to play important roles in the development of low back pain.^[1] They are perceived characteristics of the work environment that have an emotional connotation for workers and managers, and that can result in stress and strain.^[11-14]

Factors such as work demands, job control, job content, and social support have been reported as psychosocial factors at work.^[1]

Lack of job control is seen as a critical psychosocial work factor.^[5] It has been associated with an increased rate of musculoskeletal sickness absence and an increased risk of hospitalization due to musculoskeletal disorders.^[15]

Providing a greater amount of control can be achieved by, for instance, allowing workers to determine their work schedules in accordance with organizational policies and production requirements, by allowing workers to give input into decisions that affect their job, by letting workers choose the best work procedures and task order, and by increasing worker participation in the production process.^[16,17]

The primary hypothesis, that jobs which are high in demands, low in control, and also low in social support at work carry the highest risk of illness, has been empirically successful in a number of chronic disease studies.^[18,19,20]

Ergonomics risk factors are directly related to musculoskeletal discomfort.^[16] Some ergonomics risk factors that are related to low back pain are: Heavy physical work, heavy or frequent manual operations, repeated rotation of the trunk, and prolonged sitting. These risk factors have been experimentally associated with the development of injuries in spinal tissues.

Nurses are frequently required to undertake heavy lifting, often with a bent or twisted posture, and biomechanical investigations have confirmed that such tasks generate high spinal stress.^[17]

Andersson Gunnar BJ, found that university and hospital employees with occupations demanding high physical strains were absent from work, significantly more often due to low back pain than

those with light physical work.^[14] Physical load like patient handling tasks have been associated with low back pain.^[19]

In this study, the relation of intensity of low back discomfort with ergonomics risk factors and psychosocial factors were evaluated in the emergency Unit nurses of three hospitals in Esfahan. The aims of this study were:

- To evaluate the relation between ergonomics risk factors and low back discomfort.
- To evaluate the relation between psychosocial factors and low back discomfort.

It was assumed that there was a significant relation between psychosocial and ergonomics risk factors and low back discomfort.

METHODS

The participants were 79.2% female and 20.8% male. The study was conducted over a five-week period. This time was long enough to observe the relationship and fluctuations of variables. Also, this length of time was not so long that it could create dropout and attrition problems.

Participants in this study were asked to answer the questionnaire daily and at the end of the shift. During the study, 5 nurses of (B) hospital and 10 nurses of (A) stopped cooperation.

Participants were examined for not suffering low back pain before the employment.

The questionnaire survey is the most often used method for measuring psychosocial work factors in applied setting.^[11] The most discussed aspect of questionnaire-based instruments for workplace research is the issue of objective validity of self-report questionnaires. In many cases, self-reports on job conditions are the only feasible information-gathering strategy about worker's detailed social working conditions. For example, it would take an outside observer much time to understand the social support situation of the worker.^[19]

The job content questionnaire (JCQ) is a product of the studies performed by Dr. Karasek, Department of work environment, university of Massachusetts-Lowell. It outlines important aspects of psychosocial work factors. The 16 questions on psychosocial work factors were taken directly from the job content questionnaire.

Validity and reliability analysis have been performed on the questionnaire. It focuses on the psychosocial structure of the work situation,

especially issues relevant to work demands and social support. Work demand, job content, social support, job control were the psychosocial factors examined in this study and the responses ranged from 1 (none at all) to 4 (extreme).

Ergonomics hazard checklist was used for daily assessment of ergonomics risk factors. Awkward posture or static posture, manual handling, repetitiveness were the examined factors in the so called study. They were asked to assess the level of discomfort, which is defined as pain, aching, stiffness, burning, tingling or numbness for their low back. The levels of ranges for discomfort were 1 to 4 with 1 being equal to none at all to a 4 equal to extreme.^[11]

To study psychosocial factors, ergonomics risk factors and low back discomfort at the end of each day, questionnaire were collected and properly followed up.

To measure the correlation, 20 nurses participated in the study and completed the questionnaire. Correlation between questions according to Cronbach’s alpha was about 75% that was acceptable.

The final results were analyzed with SPSS software 18/PASW by using Spearman, Mann-Whitney and Kolmogorov-Smirnov test.

Findings

The overall mean age of the nurses was 34 years (SD=8.07), ranging from 22 to 52 years. The length of employment as a nurse varied, ranging from 1 to 32 years with a mean of 10 year (SD=8.22). Their average Body Mass Index (24.44±4) was in the normal range. The results showed 89.1% low

back discomfort after 5 weeks. Concerning to this results, 29.8% suffered from mild, 37.6% moderate and 21.7% severe low back pain.

The overall mean of work demand in three hospitals was 36.39 (SD=4.69) that was near to upper extreme (possible rang 12-48). Job control (32.13±13.57) was near to the middle of the range (possible range 12-48). Social support (9.11±2.33) was lower than middle. Job content was 6.17±1.14 that means it was more than middle [Table 1].

There was a significant relation between low back discomfort and psychosocial and ergonomics risk factors.

Spearman test showed that job control was the only work related psychosocial factor which had no significant relation with low back discomfort. However, there was a meaningful relationship between low back discomfort and other work concerning psychosocial factors [Table 2].

According to Spearman test, awkward posture, high frequency of patient handling at height from waist to the ground, long time standing (over half-h), weight of the patient who is handled by a nurse, were the examined ergonomics factors that had significant relation with low back discomfort.

On the other hand, no significant relation was found between low back discomfort and sitting for more than half-h [Table 3].

DISCUSSION

Based on the study, it is concluded that significant increase in ergonomics risk factors (Awkward posture, patient handling, and repetitiveness) and psychosocial factors (work demand, job content,

Table 1: Comparison of psychosocial and ergonomics factors in emergency nurses of three hospitals in Esfahan (2009)

Hospital	Job control	Social support	Work demand	Ergonomics risk factors	Job content
A					
Mean	32.13	9.11	36.39	12.48	6.28
Standard deviation	5.57	2.33	4.69	3.45	1.31
B					
Mean	32.74	8.61	35.91	12.09	5.85
Standard deviation	5.17	2.73	6.03	3.76	1.58
C					
Mean	32.76	8.31	4.34	2.87	1.34
Standard deviation	5.57	1.94	36.38	12.52	1.34
Total					
Mean	32.43	8.79	36.38	12.52	6.17
Standard deviation	5.49	2.36	4.96	3.39	1.4

Table 2: The correlation between low back discomfort in emergency nurses of three hospitals in Esfahan (1388)

	Elements	P value	Spearman coefficient
Low back complaint	Job control	0.932	0.002
Low back complaint	Social support	0.00	0.257
Low back complaint	Work demand	0.035	0.042
Low back complaint	Job content	0.00	0.377
Low back complaint	Ergonomics factors	0.00	0.495

social support, job control) in cases with low back discomfort compare to cases without low back discomfort, was recognized.

Bongers concluded that there is evidence, that poor job content and low social support are risk factors for back pain.^[21-25]

In an expansive review of the epidemiologic literature on psychosocial factors and musculoskeletal disorders, Bongers^[19] and Winter (1993) concluded that low job control and social support were all related to musculoskeletal symptoms among workers.

Longitudinal studies confirmed that psychosocial factors are major determinants of subsequent low back pain.^[26,27]

Systematic literature reviews have found evidences of a relationship between low back pain and material handling including load lifting and carrying, frequent trunk bending forward and rotation, and heavy physical exertion. Several cross-sectional studies have suggested a relationship between low back pain and static posture (e.g. standing in one place for long periods) and repetitiveness, but the results are so far limited.

Achieving the perfect job without any negative psychosocial work factors may not be feasible or realistic, given individual, organizational, or technological constraints and requirements. The balance theory (Smith and Carayon-Sainfort, 1989) proposes a job redesign strategy that aims to achieve an optimal job design. In this process, negative psychosocial work factors need to be eliminated or reduced as much as possible. However, when this is not possible, positive psychosocial work factors can be used to reduce the impact of negative psychosocial work factors.^[5]

Psychosocial experiences in the home, community and across the life span must be made a part of psychosocial analytic frameworks even when workplace effects are the primary scientific focus.^[19]

Table 3: The correlation between low back discomfort in emergency nurses of three hospitals in Esfahan (1388)

	Elements	P value	Spearman coefficient
Low back complaint	Bending	0.00	0.475
Low back complaint	Manual material handling	0.00	0.106
Low back complaint	Lifting material	0.00	0.348
Low back complaint	Sitting more than 30 min	0.00	0.417

CONCLUSION

Since the psychosocial and ergonomic factors increase the intensity of low back discomfort of nurses in emergency units, we should take it into consideration in order to produce more solutions with the aim of diminishing complain, absence and inability.

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