Relation between Workload and Level of Complaints in the Musculoskeletal System through Nordic Body Map (NBM) on E.R. Nurses

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Abstract

Nurse workload is defined as all of the activities performed by a nurse while working in a nursing service unit. Work-related musculoskeletal disorder (WMSD) is a Musculoskeletal disorder (MSD) that becomes more severe or lasts for a long time due to work-related activities. This study aims to determine the relationship between the workload of emergency room nurses and the level of complaints in the musculoskeletal system through the Nordic Body Map (NBM) method approach in every regional hospital in Tuban City. This study was carried out using descriptive correlative study method with a cross sectional approach. The number of respondents that participated in this study were 63 E.R. nurses who worked in regional hospitals in Tuban City. Data was collected using a workload questionnaire and the Nordic Body Map (NBM) method to determine the level of complaints of the musculoskeletal system. Data was then analyzed using Chi Square test. Results showed that 54% of the respondents had moderate workload and no emergency nurses at hospitals in Tuban City had light workload. 44.4% of emergency nurses at hospitals in Tuban City had severe musculoskeletal complaints. According to this data, there is a relationship between the workload of emergency room nurses and the level of complaints in the musculoskeletal system (P = 0.028). In conclusion, emergency nurses should keep an eye on their workload so that musculoskeletal problems do not occur.

Keywords: *Workload, Musculoskeletal Complaints, Nurse.*

Introduction

In the current era of globalization, health services are growing rapidly, one of which is health services in hospitals. Emergency Rooms (ER) have an environment with high physical and mental workload[1]. The emergency department is known as the most challenging department in a hospital which is proven to be related to the quality and quantity of sleep of doctors and nurses, which in turn has the potential to significantly increase medical errors[2]. Furthermore, a combination of the aforementioned conditions of work fatigue and physical exhaustion in ER nurses contribute to the increased risk of musculoskeletal disorders[2][3][4][5][6].

Musculoskeletal disorder (MSDs) is a disorder that is very common in today's society. Complaints in the musculoskeletal system are one of the most frequent reasons submitted by patients when seeking medical help[7]. Meanwhile, work-related musculoskeletal disorder (WMSD) is an MSD that deteriorates or persists for a long time due to work-related activities. WMSD is common among workers in the health sector, and nurses are a profession with a high risk of experiencing WMSD. 60% of injury reports due to work in hospitals are from nurses[8].

Health care facilities, especially hospitals, are identified as an environment with activities related to

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ergonomics, including lifting, pushing, pulling, reaching and carrying objects, in terms of patient handling. Health workers, especially those responsible for patient care, are more susceptible to hazards that may cause musculoskeletal disorders compared to workers in other fields[9]. If health workers are not careful in carrying out these activities, they may suffer from muscle, bone, tendon and nervous systems disorders called musculoskeletal disorders.

A research by Yan et al. (2017) that involved 6674 hospital nurses in Xinjiang China revealed that 81.18% of nurses suffered from WMSD since the beginning of their work and 77.43% of nurses suffered from WMSD in the last 12 months. Meanwhile, a study on 200 hospital nurses in Ajman, United Arab Emirates showed that 39% of nurses had WMSD and more than 50% performed repetitive activities that increase the risk of WMSD[10].

Nurses are at risk of experiencing WMSD due to repetitive activities in handling patients, such as transferring and repositioning patients, working in an unfavorable position and pulling or pushing heavy objects. The risk of injury increases when nurses have to deal with patients that have increased weight or size. Patients who are overweight or obese require more assistance than patients who are not obese due to the additional health problems in obesity[11]. Furthermore, nurses who work in the ER have a higher risk in experiencing WMSD. ER nurses have to deal with a wide variety of critical cases and deal with patients with severe injuries. Nurses must perform physical tasks, such as transferring patients to hospital beds, lifting patients and maintaining a bent or twisted position or posture. These risky activities often cause WMSD[12]. For this reason, this study aims to determine the relationship between the workload of emergency room nurses and the level of complaints in the musculoskeletal system through the Nordic Body Map (NBM) method approach in every regional hospital in Tuban City.

Methods

Research Design

This study used descriptive correlative study method with a cross sectional approach.

Research Sample

The population in this study were ER nurses in every regional hospital in Tuban City in 2019, with a total of 63 people. The sampling technique used in this study was total sampling. The participants of this study were all emergency nurses in every regional hospital in Tuban City, with a total of 63 people.

Research Instrument

The instrument used in this research was a written/ structured interview in the form of a questionnaire, consisting of a questionnaire on workload and the level of complaints of the musculoskeletal system. The Nordic Body Map (NBM) method was used for the questionnaire on the level of complaints of the musculoskeletal system. Nordic Body Map (NBM) is a system for measuring complaints of pain in the body known as the musculoskeletal system. This instrument was issued by the Occupational Safety and Health Administration (OSHA, 2004) and is under occupational safety law. The categorization was done by comparing the obtained score with the maximum score then multiplying the value by 100%, with results in the form of percentage[13]. The percentage results were used to provide an assessment and the level of musculoskeletal complaints were interpreted using the criteria of mild (score 0 - 20), moderate (score 21 - 41), severe (score 42 - 62) and very severe (score 63 - 84).

Data Analysis

The bivariate analysis in this study was carried out using the Chi Square test due to the nominal measuring scale variable and the two unpaired groups. Significance level with value of $p<0.05$ indicates that there is a significant correlation between workload and level of complaints of the musculoskeletal system through the Nordic Body Map (NBM) method approach.

Results

The collection of research data was carried out from September 1st to September 20th, 2019.

Table 1. Workload of ER Nurses.

Variable		n	%
Workload	Moderate	34	54
	Heavy	29	46
Total		63	100

Based on Table 1, it is known that 54% of ER nurses at regional hospitals in Tuban City have moderate workload and there are no ER nurses at regional hospitals in Tuban City who have low workload.

Table 2. Level of Complaints of ER Nurses' Musculoskeletal System.

Variabel		n	%
Musculoskeletal Complaint	Mild	13	20,6
	Moderate	22	34,9
	Severe	28	44,4
Total		63	100

Based on Table 2, it is known that 44.4% of ER nurses at regional hospitals in Tuban City have severe musculoskeletal complaints and only 20.6% have mild musculoskeletal complaints.

Table 3. Distribution of Musculoskeletal Complaints for ER Nurses according to the Nordic Body Map (NBM).

Musculoskeletal System	n	%
Upper neck	33	52
Lower neck/nape	39	62
Left shoulder	30	48
Right shoulder	34	54
Left upper arm	29	46
Back	40	63
Right upper arm	31	49
Waist	37	59
Hip	32	51
Gluteal/buttocks	27	43
Left elbow	23	37
Right elbow	21	33
Left lower arm	26	41

Cont... **Table 3. Distribution of Musculoskeletal Complaints for ER Nurses according to the Nordic Body Map (NBM).**

Right lower arm	28	44
Left wrist	23	37
Right wrist	24	38
Left hand	26	41
Right hand	30	48
Left thigh	29	46
Right hand	28	44
Left knee	28	44
Right knee	26	41
Left calf	33	52
Right calf	31	49
Left ankle	28	44
Right ankle	29	46
Left foot	35	56
Right foot	37	59

Based on Table 3, it is known that ER nurses at regional hospitals in Tuban City generally have complaints in all parts of the body. The highest number of complaints are on the back, which 63% of respondents complained about, followed by complaints on the lower neck (62%), waist (59%), right leg (59%) and left leg (56%). Meanwhile, the right elbow is only complained by 33% of ER nurses in all regional hospitals in Tuban City.

Table 4. Relation between Workload and Complaint Level of the Musculoskeletal System for ER Nurses.

Variable		Musculoskeletal Complaint						Total		p
		Mild		Moderate		Severe				
		n	%	n	%	n	%	n	%	
Workload	Moderate	8	12,7	16	25,4	10	15,9	34	54	0,028
	Heavy	5	7,9	6	9,5	18	28,5	29	46	
Total		13	20,6	22	34,9	28	44,4	63	100	

Based on Table 4, it shows that as many as 28.5% of ER nurses with heavy workload have severe complaints of the musculoskeletal system, while only 7.9% of ER nurses with heavy workloads have mild complaints of the musculoskeletal system. The result of the Chi Square test showed p value = 0.028. It can be concluded that there is a relation between the workload of emergency room nurses and the level of complaints in the musculoskeletal system.

Discussion

Workload of Emergency Room Nurses

The results of this study revealed that 54% of emergency room nurses at regional hospitals in Tuban City have moderate workload and there are no ER nurses at regional hospitals in Tuban City who have low workload. Results from a study by Haryanti et al. (2013) showed that almost all nurses (93.1%) had heavy workload[14]. According to Marquis and Huston (2010), a nurse's workload is defined as all activities performed by a nurse while working in a nursing service unit[15]. Workload is defined as 'patient days' which refers to the number of procedures, examinations and patient visits. The calculation of workload is based on the level of dependency or classification of patients. Workload can also be calculated based on nursing activities while providing nursing care. Nursing activities include direct nursing activities and indirect nursing activities[16].

Nurses in the ER face situations between life and death daily and must show skilled and high quality nursing care to patients every day[17]. Furthermore, nurses in the emergency room also have to face a high number of patients, long shifts, high-speed environments, along with emotional and physical challenges, which can negatively impact them[18].

Nurses' Complaint Levels of the Musculoskeletal System

Results showed that 44.4% of emergency room nurses at regional hospitals in Tuban City have severe musculoskeletal complaints and only 20.6% have mild musculoskeletal complaints. According to the results of the study, it is known that the majority of complaints come from the back, namely 63%. While the least complaints come from the right elbow, namely 33%.

Nurses are hospital staffs who have the most musculoskeletal complaints, together with doctors[19]. Musculoskeletal complaints are complaints in parts of the skeletal muscles that are felt by a person, ranging from very mild to very severe/painful complaints. If the muscle receives static loads repeatedly for a long period of time, it can cause damage to the joints, ligaments and tendons. This damage is known as Musculoskeletal Disorders (MSDs) or injuries to the musculoskeletal system[20]. One of the pain measurement systems that can be used is the Nordic Body Map (NBM) instrument, this instrument is issued by the Occupational Safety and Health Administration[21].

Musculoskeletal disorders include sprains, strains, tears, pain and herniation, along with connective tissue injury of muscle structures, bones, nerves, tendons, ligaments, cartilages and spinal discs. Risk factors for musculoskeletal disorders include heavy physical work, smoking, high body mass index, high psychosocial workload and the presence of comorbidities. Furthermore, the biomechanical factors that are most frequently reported to be associated with musculoskeletal disorders are the repetition of excessive activity, abnormal posture and heavy lifting[22].

The Relation between Nurses' Workload and Complaint Levels of the Musculoskeletal System

Results revealed that as many as 28.5% of ER nurses with heavy workloads have severe complaints on the musculoskeletal system, while only 7.9% of ER nurses with heavy workloads have mild complaints on the musculoskeletal system. Chi Square test results showed p value = 0.028, it can be concluded that there is a relation between the workload of emergency room nurses and the level of complaints in the musculoskeletal system.

Research by Heiden et al. (2013) reported that the high physical workload of nurses is significantly associated with musculoskeletal complaints[23]. Meanwhile, a research on emergency nurses and studied the relation between musculoskeletal disorders and workload on work schedules and job satisfaction. However, the research did not study the relationship between musculoskeletal disorders and workload. The research showed that the prevalence of musculoskeletal disorders is high in nurses who work night shifts and the level of job satisfaction is low[24,25].

Conclusion

The majority of ER nurses had moderate workload, while the level of complaints of the musculoskeletal system was mostly severe. Based on the NBM

instrument, it is known that the majority of complaints come from the back, while the least complaints come from the right elbow. One of the conditions that causes this is the intensity of treatment required for patients which can change at any time. Various competencies and procedures are additional factors that cause high workload for emergency nurses. This condition increases the risk for emergency room nurses to experience musculoskeletal disorders.

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