

Evaluation of Chronic Pain and Pain Intensity: A Study among Nurses of Iran

FATEMEH KHEIRY¹, MAHNAZ RAKHSHAN², MARYAM SHAYGAN³

ABSTRACT

Introduction: Nurses are exposed to various injuries in the upper and lower extremities.

Aim: To evaluate features of chronic pain in the upper and lower extremities and factors associated with the intensity of chronic pain among nurses.

Materials and Methods: This cross-sectional study recruited nurses with chronic pain using census sampling (n=414). Data were collected using a structured self-administered questionnaire. Data analysis was performed by using descriptive and inferential statistics.

Results: The findings of this study shows that off 414 subjects, 277 subjects (66.9%) reported chronic pain in the upper extremity and 137 subjects (33.1%) in their lower extremity. The quality of pain, pain frequency, and pain-related disabilities were

statistically different between nurses with upper limb pain and lower limb pain ($p < 0.05$). The intensity of pain was not statistically different between the two groups of nurses with chronic pain in either upper or lower extremities ($p > 0.05$). Results also showed that pain intensity was significantly associated with age, time spent in a new work position, evening shift work, and levels of pain frequency ($p < 0.05$).

Conclusion: Nurses usually complain of chronic pain in different parts of their bodies. The characteristics of pain are different in upper and lower body extremities. However, there was no significant difference in pain intensity between upper and lower limbs. Thus, implementing the preventive intervention based on the characteristics of chronic pain would help in improving the quality of nursing care.

Keywords: Disabilities, Injuries, Lower extremities

INTRODUCTION

Nursing is known as a hazardous occupation with a high risk of developing various disorders and illness. In various studies, nursing was among the top 10 occupations that cause musculoskeletal injuries [1]. As the largest group of human resources in healthcare organisations, nurses play a key role in the promotion of public health. In fact, no health organisation can achieve organisational goals without efficient nursing personnel [2]. In developed countries, nurses regularly participate in periodic occupational health and safety programs for the assessment of their health status and occupational safety; however, such important assessments are ignored in poor developing countries due to their limited financial resources [3]. High workloads, inappropriate working conditions, sleep disorders, patients with complex care needs, physically inappropriate or non-standard workplace, and periodic high workload due to lack of nursing staff are among factors associated with developing musculoskeletal disorders in nurses [4]. These disorders can occur in different parts of the body causing permanent damage and may become chronic [5].

According to the International Association for the Study of Pain (IASP), chronic pain is defined as a persistent pain lasting longer than the usual course of a disease, causes severe damages, or continues for more than 3-6 months [6]. Chronic pain is shown to negatively affect the personal and social aspects of the individual's life and may lead to emotional distress, depression, anxiety, physical disabilities, inability to work, and increased healthcare costs [7,8]. The available data on the characteristics of chronic pain in different people can be used to make effective therapeutic decisions to treat comorbid diseases associated with chronic pain and to enhance physical capability and quality of life of patients with chronic pain [9]. The intensity of experienced pain is one of the most important measures of pain assessment. There is evidence that people with high pain intensity display weaker performance on most of the mental health components, including general mental health, vitality, and social performance [10].

Moreover, information about the characteristics of chronic pain and pain intensity can help to develop and improve effective interventions [11]. Nurses are at risk of injuries in different parts of their body, still, there is no study that focused on factors associated with the intensity of chronic pain in nurses. In majority of previous studies, the characteristics of chronic pain was determined in one specific body extremity [4,12,13], or between two or three body extremities [14,15]. However, the characteristics of chronic pain have never been compared between the upper and the lower body extremities [16]. Therefore, considering the vital role of nurses in the healthcare system and the adverse effects of chronic pain on nurses' performance, the present study aimed to compare the characteristics of chronic pain in upper and lower extremities and to investigate factors associated with the intensity of chronic pain in nurses.

MATERIALS AND METHODS

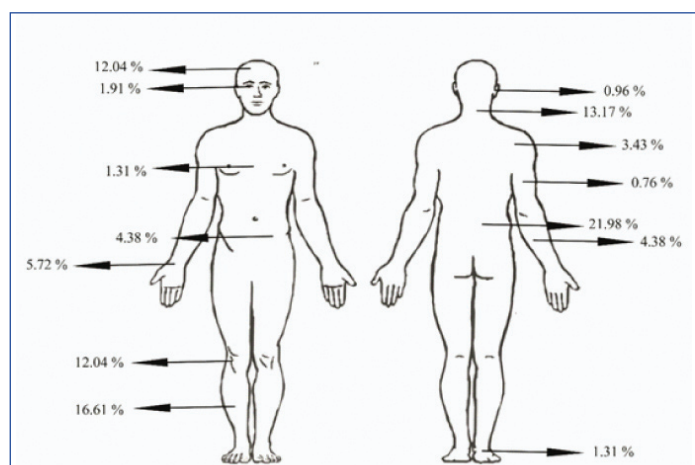
This cross-sectional study was conducted on nursing staff working in hospitals affiliated to Bandar Abbas University of Medical Sciences. The participants had either a paramedic associate's degree or BS/MS degrees in Nursing. After receiving approval and code of ethics, the researcher started the data collection process from November 2017 to January 2018.

A total of 724 nurses were selected and investigated according to their working shifts. The inclusion criteria were having more than one year of clinical work experience, and having pain for more than three months. In order to identify subjects with chronic pain at baseline, three items were developed based on ICD-11 guideline: "do you suffer from a recurrent or persistent pain?", "are you suffering from a recurrent pain for more than three months?", and "does this pain influenced your daily activities and daily living?" [17]. All respondents who answered yes to each of these three questions were asked to complete the questionnaire. The exclusion criteria were, absence from work due to sickness or other causes, and unwillingness to

participate in the study.

Finally, 414 nurses participated in this study. Power analysis with G-Power analysis software assured that the size of the sample was adequate to conduct the analysis with a statistical power (1-β error probability) of 0.95.

Data collection was performed using a researcher-made questionnaire which was developed based on the review of previous literature and experts point of view. The questionnaire consisted of three parts: 1) demographic characteristics including age, gender, marital status, educational level, work experience, type of working environment, type of employment, work shift, and professional position of the participants; 2) the anatomic section [Table/Fig-1], in which the participants were asked to mark points with chronic pain (pain that lasted for more than three months) on an image of human body anatomy; and 3) items to assessment the intensity of chronic pain and pain intensity based on the Visual Analogue Scale (VAS) on a 0-10 scale. In the VAS, there are two endpoints, as zero indicates no pain at all and 10 indicates extremely intense pain.



[Table/Fig-1]: Body map of chronic pain locations.

Additionally, questions about pain quality, last pain experience, and medical issues and limitations associated with chronic pain were asked from the participants.

Finally, both face and content validity of the designed questionnaire was confirmed based on experts' views and recommendations. To assess the reliability of the questionnaire, it was distributed among 30 nurses as a pilot test. According to the Internal Consistency (IC) of the responses and the obtained Cronbach's alpha (0.90), the questionnaire was confirmed to be a reliable scale. In other words, the items of the questionnaire adequately assessed the domain of interest.

STATISTICAL ANALYSIS

The quantitative data were expressed as Mean and Standard Deviation (SD) and qualitative data were expressed as frequency and percentage. To differentiate the characteristics of pain in the upper extremity from the lower extremity, the frequency of pain in each limb was calculated and then, the pain features in the two extremities were specified and compared using chi-squared and independent t-test. The relationships between pain intensity and demographic variables were evaluated using one-way ANOVA, Pearson Correlation test (when the data were normally distributed and variances were equal), and Kruskal-Wallis test (when the data were not normally distributed and variances were unequal). Finally, in order to examine the effect of independent variables on the intensity of pain over the past two weeks, pain intensity with a numeric scale was rated and entered into the ordinal logistic regression model. Statistical analysis was conducted using SPSS version 15.0.

RESULTS

The average age of the participants was 36.46±6.98 years. The majority of the participants were female (97.1%) and married (86.2%) with BS degree in nursing (77.3%). Out of 414 nursing staff examined in the present study, 277 subjects (66.9%) displayed suffering from chronic pain in the upper body extremity, 137 subjects

Variables	Groups	Chronic pain	Chronic pain intensity	p-value
		N (%)	Mean±SD	
Gender	Female	402 (97.1)	7.07±1.92	0.234
	Male	12 (2.9)	6.08±2.71	
Marital status	Single	57 (13.8)	7.05±1.94	0.978
	Married	357 (86.2)	7.04±1.95	
Education level	Junior college	78 (18.8)	7.84±1.75	<0.001
	Bachelor	320 (77.3)	6.87±1.96	
	Master graduate	16 (3.9)	6.62±1.58	
Type of employment	Formal	276 (66.7)	7.27±1.89	<0.001
	Contractual	80 (19.3)	6.33±1.84	
	Corporative	27 (6.5)	7.37±2.27	
	Temporary	31 (7.5)	6.54±2.01	
Occupational position	Practical nurse	75 (18.1)	6.92±1.93	<0.001
	General nurse	301 (72.7)	7.80±1.76	
	Head nurse	19 (4.6)	6.0±2.40	
	Supervisor	19 (4.6)	7.0±1.73	
Work experience (years)	Less than 10	166 (40.1)	6.80±2.09	0.028
	10-20	170 (41.1)	7.05±1.78	
	More than 20	78 (18.8)	7.52±1.91	
Type of workplace	Internal medicine department	130 (31.4)	7.10±2.05	0.550
	Surgery department	67 (16.2)	6.93±1.79	
	Emergency	64 (15.5)	6.80±1.99	
	Special needs department	100 (24.2)	6.98±1.93	
	Women and newborn	32 (7.7)	7.25±1.91	
	Psychiatric department	13 (3.1)	7.88±1.87	
	Administrative department	8 (1.9)	6.89±1.72	
		Mean±SD	r	p-value
Age		36.46±6.98	0.15	0.001
Number of work shifts in the last month		26.41±1.74	0.1	0.04
Duration of employment in new position (year)		11.46±6.69	0.18	<0.001

[Table/Fig-2]: The relationship between chronic pain intensity and demographic characteristics based on one-way ANOVA, Pearson Correlation test, Kruskal-Wallis test.

(33.1%) reported chronic pain in the lower extremity, and 3.2% displayed chronic pain in both upper and lower body extremities. Demographic characteristics of the participants are presented in [Table/Fig-2].

The majority of the participants (45.2%) complained of a lethal pain. Moreover, the last pain experience was reported mostly on the investigation day (44.7%) [Table/Fig-3]. The quality of pain, pain frequency, and pain-related disabilities were statistically different between nurses with upper limb pain and lower limb pain (p<0.05) [Table/Fig-3]. The intensity of pain was not statistically different between the two groups of nurses with chronic pain in either upper or lower extremities (p>0.05) [Table/Fig-3].

	Upper half	Lower half	p-value
Quality of pain	N (%)	N (%)	
Lethal	128 (46.2)	58 (42.6)	0.004
Sharp	10 (3.6)	7 (5.1)	
Vague	27 (9.7)	31 (22.8)	
Widespread	96 (34.7)	32 (23.5)	
Point	16 (5.8)	8 (5.9)	
Last pain experience			
Today	118 (42.6)	67 (49.3)	0.24
Last week	117 (42.2)	59 (43.4)	
More than a week less than a month	32 (11.6)	7 (5.1)	
1-3 month ago	7 (2.5)	1 (0.7)	
4-6 month ago	1 (0.4)	1 (0.7)	
More than 6 month ago	2 (0.7)	1 (0.7)	
Different frequency of pain experience			
Permanent and without interruption	55 (19.9)	21 (15.4)	0.002
One or more times per day	64 (23.1)	50 (36.8)	
One or more times per week	112 (40.4)	57 (41.9)	
One or more times per month	46 (16.6)	8 (5.9)	
Limitation associated with chronic pain			
Absence from work	1 (0.4)	1 (0.7)	0.001
Lack of interest in working extra shift	89 (32.1)	50 (36.5)	
Inability to take care of the patient	14 (5.1)	6 (4.4)	
Applying for a vacation	7 (2.5)	1 (0.7)	
Inability to perform daily activities	100 (36.1)	26 (19)	
Avoid to have some amusement	14 (5.1)	8 (5.8)	
Avoid doing sports	25 (9)	31 (22.6)	
No limitation	27 (9.7)	14 (10.2)	
	Mean±SD	Mean±SD	
Intensity of the pain in the last experience	6.95±1.95	6.83±1.71	0.53
Mean chronic pain intensity	7.11±2.01	6.89±1.83	0.27

[Table/Fig-3]: Comparison the characteristic of chronic pain in the upper and lower half of the body based on Chi-squared test and independent t-test.

The findings of this paper show that the intensity of chronic pain was significantly associated with age, educational level, type of employment, professional position, work experience, number of work shifts in the last month, and the time spent in a new position ($p < 0.05$) [Table/Fig-2].

Finally, independent variables associated with intensity of chronic

	OR	p-value	CI 95%
Age	1.05	0.047	1.001_1.112
Duration of employment in new position (year)	0.94	0.024	0.893_0.992
Number of shifts last month	1.14	0.003	1.04_1.25
Most Shift in Last Month			
Morning shift	0.58	0.091	0.31_1.08
Evening shift	0.38	0.028	0.16_0.90
Night shift	0.72	0.275	0.41_1.28
Circulating shifts		reference	
Different frequency of pain experience			
Permanent and without interruption	4.58	<0.001	2.53_9.26
One or more attacks per day	3.55	<0.001	2.05_6.15
One or more attacks a week	1.92	0.003	1.20_3.08
One or more attacks a month		reference	

[Table/Fig-4]: Factors predicting the intensity of chronic pain based on ordinal logistic regression model.

OR: Odd ratio; CI: Confidence interval

pain were entered into logistic regression model to measure their predictive power. According to the results, the intensity of pain was significantly related to age (OR=1.05, CI=1.001-1.112), time spent in a new position (OR=0.94, CI=0.893-0.992), evening shift work (OR=0.38, CI=0.16-0.90), and different frequency of pain experience ($p < 0.05$) [Table/Fig-4].

DISCUSSION

In this study, the incidence of chronic pain in the upper extremity was two times higher than the incidence in the lower extremity of the body, which was consistent with results of other studies on chronic pain among general population and nurses with musculoskeletal disorders [18-21]. There are also a number of studies on the characteristics of chronic pain in specific parts of the nurse's body [4,12,22]. Given the high prevalence of musculoskeletal disorders in nursing staff and such disorders can cause persistent pain and become chronic, it is important to address the characteristics of chronic pain in different parts of the body.

The results of this work suggest that the characteristics of chronic pain differed between nurses with chronic pain in their upper extremity and those with chronic pain in lower extremity. Also, the quality of pain was significantly different between the two groups of nurses. In a study performed in 2018 on a general population referring to a pain clinic, most of the respondents complained of spot pain [23]. However, we found that most of the respondents displayed sharp and extended pains. The pain experience was also significantly different between the two groups of participating nurses. As such, most of the nurses reported their last pain experience as 'today' or 'in the last week', and that their pain experience was either persistent or in the form of one or more attacks in the last week. These results were in compliance with studies conducted in Japan [24] and the United States [19], in which most people with chronic pain reported permanent pain experience. Moreira RF et al., found that the majority of nurses with musculoskeletal disorders reported symptoms within the last seven days and that those symptoms caused difficulties when performing their duties [20].

In the present study, the most pain-related limitation was a lack of interest in working extra shifts and inability to perform daily activities and avoiding doing exercises. However, there were significant differences between the two groups. Talati P et al., reported that most nurses with chronic back pain were suffering from medium to mild self-care issues and social problems in their daily living, and that only less than half of them were experiencing severe or very severe impairments in their daily and occupational activities, which was inconsistent with the results of the present study. They reported that the most frequent back pain-related problem was impairment in social activities, while the least frequent problems were related to recreational and self-care activities. The observed difference between the two studies can be attributed to the fact that most of the participants in Talati P et al., study had less than 10 years of work experience and their average age was 32.5±6.8 years, while the majority of the participants in the present study had more than 10 years of work experience and their average age was 36.46±6.98 years. Furthermore, they only examined back pain and ignored chronic pain in other parts of the body [25].

However, Abolfotouh SM et al., stated that one-third to half of the nurses with chronic back pain displayed many problems in their daily activities, which was consistent with the results of our study. They also proposed that nurses were unable to carry out many of their professional duties during their work shifts and that they tended to limit their social and leisure activities [26]. Therefore, it can be concluded that the majority of nurses with chronic pain experience one or more pain attacks per week and that their pain-related disabilities cause various problems in their daily activities. However, pain-related disabilities may differ between nurses with

chronic pain in the upper extremity and those with chronic pain in the lower extremity. Given that the presence of chronic pain in the upper and lower body extremities can be accompanied by various physical disabilities, increased rate of absenteeism and mental disorders [27], the differences in pain characteristics in the upper and lower extremities must be taken into account to more efficiently evaluate the characteristics of chronic pain and develop effective interventions. These issues suggest that chronic pain negatively affect people's lives and patients with chronic pain may experience harmful consequences in their social and family relationships. Such types of pain may also lead to inability to work and inadequate social, leisure, and family activities [24,28].

The average pain intensity in the examined nurses was in a range of severe pain. However, no significant difference was observed between the two groups of nurses. Hence, it could be concluded that nurses with chronic pain in the upper and lower body extremities experienced similar pain intensity, which was in accordance with other studies conducted on the general population [19,29] and nurses with exclusive chronic back pain [13]. However, these results were inconsistent with Jakobsen MD et al., who conducted a study on healthcare personnel [30]. This difference could be due to differences in the target population. Therefore, effective interventions are required to reduce pain in various parts of the body among nurses. Unfortunately, the majority of previous studies were aimed to reduce, prevent and treat pain in a limited number of body parts [31,32].

Due to their occupational demands and working conditions (e.g., standing for a long time), nurses are exposed to tissue damage that may lead to severe pain. In the present study, the most pain intensifying factor was standing up for a long time followed by stress in the workplace, which was supported by results of previous studies [33]. However, Bejia I et al., conducted a study on nurses with musculoskeletal disorders and revealed contrary results [34]. In another study, no significant relationship was found between physical factors in the workplace and the intensity of chronic pain in nurses; however, high workload and low control over work (not examined in the present study) were among the important factors associated with the intensity of back and neck chronic pain in nurses [35].

Results of the present study indicated a positive relationship between pain intensity and age so that older participants reported more intense pain. Similarly, nurses with more work shifts over the last month reported more-intense pain. The intensity of pain was also positively related to the time, during which the nurses were working in a new position. The intensity of chronic pain was also associated with the educational level, work experience, type of employment, occupational position, and different levels of pain frequency among nurses. Feng CK et al., showed that none of the demographic and occupational factors (e.g., work experience and hours of work in the last week) were related to the intensity of pain [4]. This difference could be due to different methodologies applied by Feng CK et al., and the present study. In Feng CK et al., only recruited female nurses without a university degree, who were working in homecare institutions [4].

After elimination of confounding factors, and the assumption that all model variables remained stable, the Results of logistic regression analysis showed that one unit increase in the age increased the chance of more severe chronic pain up to 1.05 times; the increase of one unit in the duration of time spent in a new position reduced the chance of more intense chronic pain up to 0.94, indicating that changes in the position are associated with the intensity of perceived pain; and the increase of one unit in the number of work shifts increased the chance of more intense chronic pain up to 1.14 times. Among the different work shifts, the chance of more intense chronic pain was 0.38 less in nurses working in evening

shifts than those working in rotating shifts. One interesting finding in the present study was the relationship between pain frequency and pain intensity. Accordingly, nurses with permanent pain, one or more pain attacks per day, and one or more pain attacks per week respectively reported 4.58, 3.55, and 1.92 times more intense pain compared to those with one or more pain attacks per month. These results indicated a direct relationship between pain intensity and pain frequency experienced by nurses.

LIMITATION

Given that the average time spent in a new position was over 11 years in this study, it can be concluded that this study was conducted on a stable population. Therefore, the observed relationships are not expected to be influenced by any bias in the section of the study's population. However, further studies are needed to evaluate the characteristics of chronic pain and other physical, occupational, and psychological factors associated with the intensity of chronic pain. This is also important to note that the present study was conducted in only one province of Iran, and therefore, further studies are required to generalise the findings.

CONCLUSION

Nurses in the present study typically complained of chronic pain in different parts of their body. According to the results, the characteristics of pain in the upper body extremity differed from the characteristics of pain in the lower extremity; however, the intensity of pain was almost similar between nurses with upper extremity pain and nurses with lower extremity pain. The nurses, in fact, experienced severe pain in both upper and lower extremities. Several factors were shown to be associated with the intensity of chronic pain among nurses. The examined nurses were experiencing various occupational and social difficulties due to such severe chronic pain that negatively affected their personal life.

ACKNOWLEDGEMENTS

This study was the result of a master thesis submitted as a partial requirement of the master degree in nursing and approved in the ethics committee affiliated with Shiraz University of Medical Sciences (decree code: IR.SUMS.REC. 1396-01-08-14141).

The researchers wish to express their gratitude to all participants for their participation in this research.

REFERENCES

- [1] Movahedi M, Ghafari S, Nazari F, Valiani M. The effect of acupressure on fatigue among female nurses with chronic back pain. *Applied Nursing Research*. 2017;36:111-14.
- [2] Nabizadeh Gharghozar Z, Atashzadeh Shoorideh F, Khazaei N, Alavi-Majd H. Assessing organisational commitment in clinical nurses. *Quarterly Journal of Nursing Management*. 2013;2(2):41-48.
- [3] De Castro A, Cabrera SL, Gee GC, Fujishiro K, Tagalog EA. Occupational health and safety issues among nurses in the Philippines. *Aaohn Journal*. 2009;57(4):149-57.
- [4] Feng CK, Chen ML, Mao IF. Prevalence of and risk factors for different measures of low back pain among female nursing aides in Taiwanese nursing homes. *BMC Musculoskeletal Disorders*. 2007;8(1):52.
- [5] Mchugh G, Thoms G. Living with chronic pain: the patient's perspective. *Nursing standard (Royal College of Nursing (Great Britain): 1987)*. 2001;15(52):33-37.
- [6] Merskey HE. Classification of chronic pain: descriptions of chronic pain syndromes and definitions of pain terms. *Pain*. 1986.
- [7] Williams DA. The importance of psychological assessment in chronic pain. *Current Opinion in Urology*. 2013;23(6):554.
- [8] Meints S, Edwards R. Evaluating psychosocial contributions to chronic pain outcomes. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*. 2018;87(B):168-82.
- [9] Puntillo K, Naidu RK. Measurement of chronic pain and opioid use evaluation in community-based persons with serious illnesses. *Journal of Palliative Medicine*. 2018;21(S2):S43-S51.
- [10] Forbes A, While A, Mathes L, Griffiths P. Health problems and health-related quality of life in people with multiple sclerosis. *Clinical Rehabilitation*. 2006;20(1):67-78.
- [11] Sharma S, Shrestha N, Jensen MP. Pain-related factors associated with lost work days in nurses with low back pain: A cross-sectional study. *Scandinavian Journal of Pain*. 2016;11:36-41.
- [12] Wang Y, Xie J, Yang F, Wu S, Wang H, Zhang X, et al. The prevalence of primary

- headache disorders and their associated factors among nursing staff in North China. *The Journal of Headache and Pain*. 2015;16(1):4.
- [13] Afsari E, Soleimani Y, Talati P, Jalali F. Evaluation of quality of life of nurses working with chronic low back pain in educational hospitals of Tabriz in 2013. *Nursing and Midwifery Clinical Journal*. 2013;3(4):28-30.
- [14] Violante FS, Fiori M, Fiorentini C, Risi A, Garagnani G, Bonfiglioli R, et al. Associations of psychosocial and individual factors with three different categories of back disorder among nursing staff. *Journal of Occupational Health*. 2004;46(2):100-08.
- [15] Long MH, Johnston V, Bogossian F. Work-related upper quadrant musculoskeletal disorders in midwives, nurses and physicians: A systematic review of risk factors and functional consequences. *Applied Ergonomics*. 2012;43(3):455-67.
- [16] Çelik S, Tasdemir N, Öksüzoglu A, Dirimese E, Koçasli S. Critical-Care Nurses' Pain Experiences and the Prognostic Factors. *Dimensions of Critical Care Nursing*. 2018;37(1):3-11.
- [17] Treede RD, Rief W, Barke A, Aziz Q, Bennett MI, Benoliel R, et al. A classification of chronic pain for ICD-11. *Pain*. 2015;156(6):1003-07.
- [18] Menzel NN. Psychosocial factors in musculoskeletal disorders. *Critical Care Nursing Clinics*. 2007;19(2):145-53.
- [19] Johannes CB, Le TK, Zhou X, Johnston JA, Dworkin RH. The prevalence of chronic pain in United States adults: results of an Internet-based survey. *The Journal of Pain*. 2010;11(11):1230-39.
- [20] Moreira RF, Sato TO, Foltran FA, Silva LC, Coury HJ. Prevalence of musculoskeletal symptoms in hospital nurse technicians and licensed practical nurses: associations with demographic factors. *Brazilian Journal of Physical Therapy*. 2014;18(4):323-33.
- [21] Langerud AK, Rustøen T, Brunborg C, Kongsgaard U, Stubhaug A. Prevalence, location, and characteristics of chronic pain in intensive care survivors. *Pain Management Nursing*. 2018;19(4):366-76.
- [22] Smedley J, Inskip H, Trevelyan F, Buckle P, Cooper C, Coggon D. Risk factors for incident neck and shoulder pain in hospital nurses. *Occupational and Environmental Medicine*. 2003;60(11):864-69.
- [23] Pagé MG, Fortier M, Ware MA, Choinière M. As if one pain problem was not enough: prevalence and patterns of coexisting chronic pain conditions and their impact on treatment outcomes. *Journal of pain research*. 2018;11:237.
- [24] Sugai K, Tsuji O, Matsumoto M, Nishiwaki Y, Nakamura M. Chronic musculoskeletal pain in Japan (the final report of the 3-year longitudinal study): Association with a future decline in activities of daily living. *Journal of Orthopaedic Surgery*. 2017;25(3):2309499017727945.
- [25] Talati P, Mamaghani EA, Kiwi YS, Jalali F, Iran P, Atai L. Assessing quality of life in nurses with chronic low back pain working in educational hospitals in Tabriz, 2013. *Journal of Clinical Nursing and Midwifery*. 2015;4(3):20-28.
- [26] Abolfotouh SM, Mahmoud K, Faraj K, Moammer G, ElSayed A, Abolfotouh MA. Prevalence, consequences and predictors of low back pain among nurses in a tertiary care setting. *International Orthopaedics*. 2015;39(12):2439-49.
- [27] Carnes D, Parsons S, Ashby D, Breen A, Foster N, Pincus T, et al. Chronic musculoskeletal pain rarely presents in a single body site: results from a UK population study. *Rheumatology*. 2007;46(7):1168-70.
- [28] Martinez-Calderon J, Zamora-Campos C, Navarro-Ledesma S, Luque-Suarez A. The role of self-efficacy on the prognosis of chronic musculoskeletal pain: a systematic review. *The Journal of Pain*. 2018;19(1):10-34.
- [29] Nakamura M, Nishiwaki Y, Ushida T, Toyama Y. Prevalence and characteristics of chronic musculoskeletal pain in Japan: a second survey of people with or without chronic pain. *Journal of Orthopaedic Science*. 2014;19(2):339-50.
- [30] Jakobsen MD, Sundstrup E, Brandt M, Andersen LL. Effect of physical exercise on musculoskeletal pain in multiple body regions among healthcare workers: Secondary analysis of a cluster randomized controlled trial. *Musculoskeletal Science and Practice*. 2018;34:89-96.
- [31] Van Hoof W, O'Sullivan K, O'Keefe M, Verschueren S, O'Sullivan P, Dankaerts W. The efficacy of interventions for low back pain in nurses: A systematic review. *International Journal of Nursing Studies*. 2018;77:222-31.
- [32] Dehghan M, Malekpour A, Mardani F. The effects of performing Williams exercise and walking on relief on non-traumatic low back pain in nurses. *Iran Occupational Health*. 2017;14(5):83-75.
- [33] Shieh SH, Sung FC, Su CH, Tsai Y, Hsieh VC-R. Increased low back pain risk in nurses with high workload for patient care: A questionnaire survey. *Taiwanese Journal of Obstetrics and Gynecology*. 2016;55(4):525-29.
- [34] Bejia I, Younes M, Jamila HB, Khalfallah T, Salem KB, Touzi M, et al. Prevalence and factors associated to low back pain among hospital staff. *Joint Bone Spine*. 2005;72(3):254-59.
- [35] Alexopoulos EC, Burdorf A, Kalokerinou A. Risk factors for musculoskeletal disorders among nursing personnel in Greek hospitals. *International Archives of Occupational and Environmental Health*. 2003;76(4):289-94.

PARTICULARS OF CONTRIBUTORS:

1. Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran.
2. Associate Professor, Community Based Psychiatric Care Research Center, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran.
3. Assistant Professor, Community Based Psychiatric Care Research Center, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Mahnaz Rakhshan,
Z and Biv- School of Nursing and Midwifery, Shiraz, Postal Code: 0098-713451359, Iran.
E-mail: mzhakhshan@gmail.com

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Oct 02, 2018**
Date of Peer Review: **Dec 06, 2018**
Date of Acceptance: **Jan 17, 2019**
Date of Publishing: **Mar 01, 2019**