Internal MedicineToday
Gonabad University of Medical Sciences
May 2024. Vol 30. Issue 4

Research Paper

The Incidence of Musculoskeletal Disorders and Their Relationship with Work-Family Conflict in Nurses: A Cross-Sectional Study

Maryam Moaven Saidi[1], Maryam Ramezani[2], Ali Firoozi Chahak[3], Mehrsa Basiri Moghadam[4]*

1. Assistant Professor of Occupational Medicine, Department of Internal Medicine, School of Medicine, Social Determinants of Health Research Center, Bohlool Hospital, Gonabad University of Medical Sciences, Gonabad, Iran
2. Medical Student, School of Medicine, Gonabad University of Medical Sciences, Gonabad, Iran
3. Associate Professor of Occupational Health Engineering, Department of Occupational Health Engineering, School of Health, Social Determinants of Health Research Center, Gonabad University of Medical Sciences, Gonabad, Iran
4. Associate Professor, Community Health Department, School of Nursing, Nursing Research Center, Gonabad University of Medical Sciences, Gonabad, Iran

Use your device to scan and read the article online

Citation Moaven Saidi M, Ramezani M, Firoozi Chahak A, Basiri Moghadam M. [Incidence of Musculoskeletal Disorders and Their Relationship with Work-Family Conflict in Nurses: A Cross-Sectional Study]. Internal Medicine Today. 2024; 30(4): 140-147.

:https://doi.org/10.22034/imtj.2024.30.3.140

CC BY NC

Received: February 11, 2024
Accepted: July 24, 2024
Publsihed: September 28, 2024

Keywords:
Musculoskeletal disorders (MSDs)
Nurse
Work-family conflict

ABSTRACT

Aims Identifying and investigating the factors that cause musculoskeletal disorders (MSDs) can help improve the quality of life and prevent burnout among nurses. This study aimed to investigate the status of MSDs and their relationship with work-family conflict among nurses.

Materials & Methods In this analytical cross-sectional study, after obtaining permission from the Ethics Committee of Gonabad University of Medical Sciences, Gonabad, Iran, nurses working in the clinical wards of Allameh Bohlool Hospital in 2024 were selected using a simple random sampling method and included in the study if they met the inclusion criteria. After obtaining informed consent from the participants, demographic information questionnaires, the Nordic Musculoskeletal Questionnaire, and the Carlson Work-Family Conflict Scale were provided to them. The obtained data were analyzed using SPSS (version 25), and $P < 0.05$ was considered significant.

Results A total of 97 nurses with a mean age of 33.39 ± 6.88 years were included in this study. A total of 52 (53.6%) were female; 86 participants (88.7%) had musculoskeletal pain at least once in the past 12 months. The most common site of MSDs was the back (62.9%). A total of 64.9% had MSDs at least once in the past 12 months that led to reduced work activity. The highest observed conflict was work-family time-based conflict, with a mean of 11.46, and the lowest was work-family pressure-based conflict, with a mean of 7.27. No significant difference was observed in any of the dimensions of the work-family conflict questionnaire between participants with and without MSDs in the last 12 months ($P > 0.05$).

Conclusion Given the high prevalence of MSDs among nurses, managers should take measures in this regard. In addition, the lack of a relationship between work-family conflict and MSDs in this study suggests the need for researchers to consider other factors. Other factors associated with MSDs in nurses may be investigated in future studies.

Corresponding Author:
Mehrsa Basiri Moghadam
Address: Community Health Department, School of Nursing, Nursing Research Center, Gonabad University of Medical Sciences, Gonabad, Iran
Tel: 05157223028
Email: k.basiri@gmu.ac.ir

Introduction

Musculoskeletal disorders (MSDs) are among the leading causes of pain and disability in the workforce. Nursing is considered a high-risk occupation for MSDs, accounting for nearly half of all injury and illness cases occurring annually within this occupational group [1]. Due to the physically demanding nature of their work and the psychological stressors, nurses are among the professional groups with a higher prevalence of MSDs [2]. Approximately one-quarter of nurses suffer from work-related physical pain, including low back pain, and one in every three nurses develops work-related low back pain [3]. A review study conducted in 2015 reported that 4.7% of nurses are absent from work each week due to emotional exhaustion or job-related physical disability, a rate 80% higher than that observed in other professional groups [4]. The most important physical and ergonomic factors associated with MSDs include unfavorable mechanical conditions in the workplace, improper manual handling of loads, nonstandard workstation design, and repetitive movements. Unlike many occupational diseases, which usually arise from exposure to a specific hazardous substance, MSDs are influenced not only by environmental factors but also by individual characteristics, such as age, gender, type of job, and daily working hours [3].

In addition, psychosocial risk factors, such as job stress, lack of support from colleagues or supervisors, and high workload, contribute to the development or exacerbation of these disorders [5]. Studies have shown that stress, as a predisposing factor, plays a role in the development of physical illnesses, including MSDs [3, 6]. Psychosocial factors affecting these disorders include time pressure, heavy workload, and inadequate social support. However, the psychosocial aspects of work involved in the occurrence of MSDs among nurses have rarely been investigated [7]. One potential psychosocial factor associated with MSDs is work–family conflict. Work and family are generally viewed as two distinct yet interdependent domains, with boundaries that are to some extent permeable. Critical situations may alter the permeability of these boundaries and increase integration between the two domains through the exchange of ideas and the spillover of concerns [8]. Work–family conflict is defined as a form of inter-role conflict in which the demands and pressures associated with occupational and family roles are incompatible [9, 10]. Since this type of conflict is itself a source of stress, it may negatively affect individuals' mental health and job satisfaction. Work–family conflict is bidirectional; that is, pressures arising from the work environment may affect an individual's family life, while family-related problems and role ambiguity may also interfere with the proper performance of occupational duties [10].

Work–family conflict can have undesirable consequences. A study conducted in Jakarta showed that work–family conflict among nurses resulted in impaired performance, reduced quality of care [11], and decreased intention to remain in the profession [12]. However, reducing work–family conflict among nurses may lessen their workload, burnout, and stress levels [13]. Another study found that work-related conflict extending into the family domain was directly associated with an increased risk of cardiovascular problems and sleepiness [14].

Several studies in different organizations have examined the relationship between MSDs and work–family conflict. For instance, Malekouti Khah's study in the steel industry demonstrated an association between MSDs and family conflicts [10]. Likewise, Nützi et al. [7], in a study of operating room nurses, found that reducing work–family conflict and workplace interruptions, as well as providing opportunities for influence in the workplace, could help improve the health of operating room nurses.

Identifying and examining the factors contributing to MSDs is the first step toward reducing their occurrence. Given the importance of investigating MSDs, previous studies have mainly focused on individual and occupational factors. Today, increasing attention has been directed toward examining the effect of work–family conflict on the development of physical and psychological illnesses among employees. Since no study has yet been conducted on the prevalence of MSDs among nurses in Gonabad, Iran, the present study was conducted in 2024 to determine the prevalence of MSDs and examine their association with work–family conflict among nurses at Behloul Hospital in Gonabad, Iran.

Materials and Methods

Study Design and Participants

This applied study was conducted using a scientometric approach with an analytical perspective. The aim was to map, analyze, and visualize the scientific output related to brucellosis at the global level. Scientometric indicators were used to examine publication trends, thematic structures, and collaboration patterns within the field.

This cross-sectional analytical study was conducted in 2024, involving 97 clinical nurses working in the medical, surgical, intensive care, and emergency departments of Allameh Behloul Gonabadi Hospital. The sample size was calculated using the formula for estimating the mean, based on the findings of Obrenovic et al. [15] regarding the work–family conflict variable. Considering a 95% confidence level, a margin of error equal to 22% of the standard deviation, and a standard deviation of 12.352 for work–family conflict, the sample size was initially determined to be 79 participants. Accounting for an estimated attrition rate of 20%, the final sample size was established at 97 nurses.

The inclusion criteria included having at least one year of work experience, employment in clinical departments, no history of musculoskeletal surgery or trauma leading to injury in the specified body regions, no second job, no MSDs at the time of employment, and no history of psychiatric disorders. The exclusion criterion was incomplete questionnaire responses.

Sampling and Data Collection

After obtaining approval from the Research Council of the Faculty of Medicine and the Ethics Committee of Gonabad University of Medical Sciences and coordinating with the relevant hospital authorities, clinical nurses were selected using a stratified random sampling method. Each department was considered a stratum, and the number of participants from each department was determined proportionally. Participants were randomly selected within each stratum. The researcher visited the departments during different working shifts (morning, evening, and night). After explaining the study objectives and obtaining written informed consent, the researcher distributed the demographic questionnaire, the Nordic Musculoskeletal Questionnaire (NMQ), and the Carlson and Kacmar Work–Family Conflict Scale. The completed questionnaires were collected during the same shifts. All selected nurses completed the questionnaire.

Instruments

1. **Demographic Questionnaire:** This form collected information on age, marital status, education level, department, shift work, and gender.
2. **Carlson and Kacmar Work–Family Conflict Scale:** This 18-item instrument measures conflict in two directions: work–family conflict (nine items) and family–work conflict (nine items). It comprises three dimensions: time-based (three items), strain-based (three items), and behavior-based conflict (three items). Responses were scored on a 5-point Likert scale (1 = never, 2 = most of the time, 3 = sometimes, 4 = rarely, 5 = always). The total score ranges from 9 to 45, with higher scores indicating higher levels of conflict. The reliability of this questionnaire was confirmed by Ghasemi et al. using Cronbach's alpha coefficient, which was reported to be 0.84 [16].
3. **Nordic Musculoskeletal Questionnaire (NMQ):** This self-administered questionnaire was designed to screen for musculoskeletal symptoms. Respondents indicated whether they had experienced pain or discomfort in any of the nine body regions (neck, shoulders, elbows, wrists/hands, upper back, lower back, hips/thighs, knees, and ankles/feet) during the past 12 months. The questionnaire consisted of 37 items, including 9 items on demographic characteristics, 8 items on the severity of pain, burning sensation, and discomfort in different body parts, 12 items on physical job demands, and 8 items on psychological job demands that assessed whether the symptoms required medical attention, sick leave, or work activity restriction (answered as Yes/No). The validity and reliability of this instrument have been confirmed in various studies [17].

Statistical Analysis

The collected data were entered into SPSS software (version 22) for statistical analysis. Descriptive statistics, including measures of central tendency and dispersion, were used for quantitative variables, while frequency distributions were used for qualitative variables. The normality of data distribution was assessed using the Kolmogorov–Smirnov test. For quantitative variables, independent-samples t tests were used for between-group comparisons if the data were normally distributed; otherwise, the Mann–Whitney U test was applied. Associations between qualitative variables were evaluated using the chi-square test or Fisher's exact test. The significance level was set at $P < 0.05$.

Ethical Considerations

This study was approved by the Ethics Committee of Gonabad University of Medical Sciences, Gonabad, Iran (Ethics Committee Reference Number: IR.GMU.REC.1401.096). The rights of authors in all publications resulting from this research were observed in accordance with regulations. Participant confidentiality and anonymity were strictly maintained. Necessary permissions were obtained prior to entering the clinical environment and starting data collection. All general ethical codes issued by the Ministry of Health and Medical Education were strictly followed.

Results

A total of 97 nurses with a mean age of 33.39 ± 6.88 years participated in the study, of whom 53.6% were female. The majority of the research units (57.7%) had working hours of up to 8 hours per day with a single shift (morning, afternoon, or night), while the remaining participants worked more than one shift per day (Table 1). No significant correlation was found between demographic variables and MSDs.

Regarding the prevalence of MSDs, the results indicated that the most prevalent disorders in the last 12 months were related to the lower back (62.9%), shoulder (49.5%), and knee (46.4%). In the last 7 days, the most frequent sites were the lower back (59.8%), knee (44.3%), and neck (37.1%). Notably, low back disorders led to reduced work activity in 40.2% of cases. Overall, 88.7% of the participating nurses experienced at least one musculoskeletal pain point in the past 12 months, and 87.6% in the past 7 days. The most common site of MSDs was the lower back (62.9% in the last 12 months and 59.8% in the last 7 days), and 64.9% of individuals experienced disorders that resulted in reduced work activity or absenteeism in the last 12 months (Table 2). The most prevalent type of conflict observed among participants was work-family conflict, with a mean score of 11.46 out of 15. Conversely, the least prevalent was family-work interference, with a mean score of 7.27 (Table 3). No significant differences were observed between the demographic variables of patients with and without MSDs in the last 12 months ($P > 0.05$; Table 4). Furthermore, no significant correlation was found between the dimensions of work-family conflict and MSDs in the last 12 months or the last 7 days ($P > 0.05$; Table 5). Additionally, no significant association was observed between the dimensions of work-family conflict and MSDs resulting in reduced work activity in the last 12 months ($P > 0.05$; Table 6).

Table 1. Demographic Characteristics of the Study Participants.

Characteristic	Category	No	%
Gender	Female	52	53.6
	Male	45	46.4
Marital status	Married	79	81.4
	Single	18	18.6
Education level	Bachelor's degree	92	94.8
	Master's degree or higher	5	5.2
Working hours	Up to 8 hours	56	57.7
	More than 8 hours	41	42.3
Extracurricular work activity	Yes	33	34.0
	No	64	66.0
Regular exercise	Yes	27	27.8
	No	70	72.2

Table 2. Prevalence of Musculoskeletal Disorders (MSDs) among Participants

Anatomical Region	MSDs in the Last 12 Months, No. (%)	MSDs in the Last 7 Days No. (%)	MSDs Leading to Reduced Activity No. (%)
Neck	37 (38.1)	36 (37.1)	15 (15.5)
Shoulder	48 (49.5)	31 (31.9)	15 (15.5)
Elbow	19 (19.6)	16 (16.5)	5 (5.1)
Wrist	23 (34.0)	13 (13.5)	11 (11.4)
Upper back	41 (42.3)	29 (29.9)	13 (13.4)
Lower back	61 (62.9)	58 (59.8)	39 (40.2)
Hips	32 (33.0)	24 (24.7)	2 (2.1)
Knee	45 (46.4)	43 (44.3)	21 (21.6)
Ankle	19 (19.6)	22 (22.7)	4 (4.1)
Overall MSD (at least one site)	86 (88.7)	85 (87.6)	63 (64.9)

*Percentages calculated based on total participants (n = 97).

Table 3: Participants' Scores in Different Dimensions of the Work-Family Conflict Questionnaire

Dimension	Conflict Type	Mean	SD	Min	Max
Time-based conflict	Work-to-Family	11.46	2.25	4	15
	Family-to-Work	9.02	2.30	3	14
Strain-based conflict	Work-to-Family	9.67	2.58	4	15
	Family-to-Work	7.27	2.36	3	13
Behavior-based conflict	Work-to-Family	9.36	2.47	5	15
	Family-to-Work	9.34	2.15	4	15
Total Score		56.13	8.02	32	74

Table 4. Comparison of Demographic Characteristics between Participants with and without Musculoskeletal Disorders (MSDs) in the Last 12 Months

Characteristic	Category	Without MSDs, No. (%)	With MSDs, No. (%)	*P* Value
Gender	Female	3 (60.0)	49 (53.2)	>0.999*
	Male	2 (40.0)	43 (46.8)	
Marital status	Married	4 (80.0)	75 (81.5)	>0.999*
	Single	1 (20.0)	17 (19.5)	
Education level	Bachelor's	4 (57.1)	88 (97.7)	0.412*
	Master's or Higher	3 (42.9)	2 (2.3)	
Working hours	8 hours	4 (80.0)	52 (56.5)	0.393*
	>8 hours	1 (20.0)	40 (43.5)	
Extracurricular Work	Yes	12 (80.0)	21 (25.6)	0.659*
	No	3 (20.0)	61 (74.4)	
Regular exercise	Yes	2 (13.3)	25 (30.5)	0.616*
	No	13 (86.7)	57 (69.5)	

*Fisher's Exact Test. Significance level < 0.05.

Table 5. Comparison of Work-Family Conflict Dimensions between Participants with and without Musculoskeletal Disorders (MSDs) in the Last 12 Months

Dimension	Conflict Type	Without MSDs Median (Q1-Q3)	With MSDs Median (Q1-Q3)	*P*-Value
Time-based	Work-to-Family	9 (8-12)	9 (8-12)	0.543*
	Family-to-Work	8 (7-10)	7 (6-9)	0.931*
Strain-based	Work-to-Family	11 (6-12)	9 (8-11)	0.977*
	Family-to-Work	10 (8-11)	9 (8-11)	0.095*
Behavior-based	Work-to-Family	12 (12-12)	12 (10-13)	0.680*
	Family-to-Work	10 (6-11)	9 (7-11)	0.805*
Total Score	(Mean ± SD)	58.00 ± 10.86	56.03 ± 7.91	0.596**

*Mann-Whitney U test. **Independent *t-test*.
Significance level < 0.05.

Table 6. Comparison of Work-Family Conflict Dimensions Between Participants with and without Musculoskeletal Disorders (MSDs) Leading to Reduced Activity

Dimension	Conflict Type	Without MSDs Median (Q1-Q3)	With MSDs Median (Q1-Q3)	*P* Value
Time-based	Work-to-Family	9 (8-11)	10 (8-12)	0.088*
	Family-to-Work	7 (6-8)	7 (6-9)	0.504*
Strain-based	Work-to-Family	9 (7-11)	9 (8-11)	0.269*
	Family-to-Work	9.5 (8-10)	9 (8-11)	0.775*
Behavior-based	Work-to-Family	11 (9-12)	12 (11-13)	0.529*
	Family-to-Work	9 (8-11)	9 (7-11)	0.661*
Total score	(Mean ± SD)	55.68 ± 7.86	56.29 ± 8.13	0.745**

Discussion

Regarding the prevalence of MSDs, the findings of the present study showed that nearly 90% of all nurses had experienced at least one musculoskeletal disorder during the previous year, and the vast majority of these individuals had also experienced such a disorder during the previous week. The most commonly affected site was the lower back, with nearly 63% of nurses experiencing low back pain during the previous year. The second most common site of MSDs was the shoulder, with nearly half of the participants reporting pain and discomfort in this region during the previous year and 30% reporting pain and discomfort during the previous week. The relatively infrequently affected sites were the ankle and elbow, each reported by fewer than 20% of participants. The results also showed that 65% of all participants had experienced at least one musculoskeletal problem during the previous year that had led to rest, reduced work activity, or leaving the workplace. Consistent with the previously mentioned findings, the most common site of such disorders was again the lower back, observed in 40% of participants. In this regard, Parnoo et al., in a 2017 meta-analysis, reported a relatively high prevalence of MSDs in both the lower extremities (particularly the lower back) and the upper extremities (especially the neck and shoulders) among Iranian workers [18]. In Sun's study, the prevalence of MSDs among nurses was 77.2%, with discomfort reported in the back and lower back in 59.5% of cases, in the neck in 53%, and in the shoulder in 46.8% [19]. Ebrahimi also demonstrated that the interaction of prolonged sitting and poor workstation posture may, through certain biomechanical changes, increase the risk of spinal MSDs, a pattern also observed among healthcare personnel [9]. Similarly, in Hashemi Habibabadi's study, the lower back was reported as the most common site of MSDs [20]. Notezi et al. showed that 66% of operating room nurses suffered from musculoskeletal problems, with low back pain (52.7%) and neck pain (38.4%) being the most common complaints [7].

The high prevalence of MSDs among nurses constitutes a major challenge for healthcare systems worldwide. This issue arises from the specific nature of the nursing profession and the combined influence of multiple physical and psychological factors that impose considerable strain on the body. The combination of continuous physical demands, high-pressure working conditions, occupational stress, lack of support from colleagues or managers, high mental workload, and similar factors may prevent nurses' bodies from having adequate time to recover, thereby contributing to the high prevalence of MSDs in this occupational group [5].

Regarding work–family conflict, the present study showed that the participants' mean total score on the work–family conflict questionnaire was 56. Given that the minimum and maximum attainable scores on this questionnaire are 18 and 90, respectively, the midpoint score was 54. Therefore, the level of work–family conflict among the nurses participating in the present study was moderate. In the studies by Ahmadzadeh Zeidi [21] and Bolandian [22], work–family conflict among nurses was also reported to be moderate. Mosaddgh Rad et al. showed in their study that head nurses experienced conflict within the moderate range, whereas nurses' conflict was above average [23]. In the present study, the nurses' scores were approximately at the midpoint. One possible explanation for the lower level of work–family conflict among nurses in the present study compared with the study by Mosaddegh Rad et al. may be that their study was conducted in hospitals affiliated with Tehran University of Medical Sciences, where staff deal with a very high volume of patients daily, whereas the hospital in the present study was relatively less crowded. In addition, the traffic congestion and long commuting distances in Tehran may further exacerbate work–family conflict, which may explain the lower level observed in the present study compared with that reported by Mosaddegh Rad et al. Overall, it appears that the occupational burden resulting from nurses' job stress and its interference with other life roles supports the presence of work–family conflict in this group.

Furthermore, in the present study, time-based work–family conflict had the highest mean score, 11.46 out of 15. This finding indicates that time-based work–family conflict is the most important form of conflict experienced by the nurses in the present study. Hasabi's study showed that time-based family–work conflict was one of the most influential domains contributing to nurses' conflict [24]. Similarly, in Imanipour's study, time-based conflict was greater than strain-based conflict [25]. In contrast, the least prevalent type of conflict observed in the present study was strain-based family–work conflict, with a mean score of 7.27. However, in Hasabi's study, strain-based conflict also had one of the highest scores; this discrepancy may be due to differences in the study population, as 92.2% of participants were women [24]. Time-based conflict occurs when the time devoted to work reduces the opportunity for

involvement in family life. Thus, because nurses spend many hours at the workplace, they may not have sufficient time to attend to family matters, spouses, children, or household responsibilities. In a 2023 study by Ebrahimi et al. conducted among the staff of Social Security hospitals in Chaharmahal and Bakhtiari Province, the mean percentage of the maximum possible score for work–family conflict was 61.8% [9]. Compared with that study, work–family conflict was slightly lower in the present study, since the participants' score was approximately at the midpoint between the minimum and maximum possible scores. Conflict between two major aspects of life, namely work and family, is regarded as one of the most important global challenges in the nursing profession. Compared with other members of the healthcare team, nurses experience greater work–family conflict and, consequently, are more prone to negative psychological outcomes, such as a heightened sense of vulnerability, helplessness, and loss of control [25].

In addition, regarding the association between MSDs and work–family conflict, the findings of the present study showed that none of the different dimensions of work–family conflict differed significantly between participants with and without MSDs. In Ebrahimi's study, a positive relationship was found between MSDs and work–family conflict [9]. Notezi's study showed that work–family conflict significantly predicted low back and neck pain among operating room nurses ($P < 0.05$). In contrast to these findings, no association was observed between MSDs and work–family conflict in the present study. One possible explanation is that the study population in the present study consisted exclusively of nurses, whereas Ebrahimi's study included all hospital staff. In addition to studies examining work–family conflict among nurses and other healthcare personnel, some investigations have assessed this issue in other occupational groups. In a 2017 study, Malekoutikhah et al. examined the relationship between MSDs and work–family conflict among employees in Iran's steel industry. Their findings showed that overall conflict, as well as the subscales of time-based conflict in both family-to-work and work-to-family directions, strain-based conflict only in the work-to-family direction, and behavior-based conflict only in the family-to-work direction, had significant associations with MSDs [10]. Compared with the study by Malekoutikhah et al., the present study's findings suggest a higher level of work–family conflict among nurses than among steel industry workers, since the mean score for participants in the present study was 56. As mentioned earlier, nurses appear to be among the occupational groups more exposed to work–family conflict than many other professions. However, regarding the relationship between work–family conflict and MSDs, no such association was observed in the present study, in contrast to the above-mentioned study. The relatively small sample size of the present study may have contributed to this finding.

The findings of the present study also showed that the prevalence of MSDs did not differ significantly according to age, marital status, education, workplace, work shift, or sex. Similarly, Rokni reported no significant association between gender, work schedule, and education and MSDs, which is consistent with the findings of the present study [26]. However, Rokni did find a significant association between age and low back pain. This discrepancy may be attributable to differences in the ergonomic conditions of the work environment in 2016 compared with those experienced by nurses in hospital wards. In Asghari's study, MSDs were more common among women and among those working rotating shifts [27]. This inconsistency may be due to differences in the study population. The participants in Asghari's study were operating room nurses, and the specific conditions of the operating room, patient handling, and prolonged work may be more difficult and physically demanding for female staff.

It should be noted that the "reduced work activity" index in the present study was derived from the item related to activity limitation in the Nordic questionnaire, and no independent instrument, such as the Cornell questionnaire, was used. Therefore, caution is warranted when making direct comparisons with studies that used the Cornell questionnaire. The relatively small sample size and the inability to investigate all variables affecting MSDs in depth were among the limitations of this study. In addition, data collection in this study was performed using self-report questionnaires; therefore, some participants may have refrained from providing fully accurate responses.

Conclusion

Given the high prevalence of MSDs among nurses, strategies aimed at reducing these disorders should be prioritized by healthcare managers. In addition, to reduce work–family conflict, managers should consider implementing workshops on professional ethics and resilience and provide adequate training in managing unexpected and stressful situations. Furthermore, educating nurses on effective communication with family members, maintaining balance among assigned roles, and developing self-reflection and problem-solving skills, as well as efforts to preserve mental health, may be beneficial. Since no significant association was found between MSDs and work–family conflict, it is possible that other factors, including physical factors and improper manual handling, may play a more important role, or that the lack of association may be attributable to the relatively small sample size. Nevertheless, future studies with larger sample sizes are recommended to obtain more robust evidence. Although work–family conflict was not directly associated with these disorders in the present study, such conflict may still contribute to the development or exacerbation of stress in individuals. Over time, occupational stress, time pressure, heavy workload, and lack of social support may influence the occurrence of MSDs. Therefore, longitudinal studies in this area may provide more reliable results.

Ethical Considerations

Compliance with ethical guidelines

All ethical considerations required by the relevant

ministry have been observed. The ethics code for the project is IR.GMU.REC.1401.096.

Funding

This article is derived from a general medicine thesis, and no funding was received.

Authors' contributions

Study design: Meisam Dastani, Jalal Mardaneh; Data collection: Elaheh Moradi, Hamideh Mohammadzadeh; Data analysis: Meisam Dastani, Jalal Mardaneh; Manuscript writing: Meisam Dastani, Elaheh Moradi, Hamideh Mohammadzadeh; Critical revision and approval of the final manuscript: All authors.

Conflicts of interest

The authors declared no conflicts of interest.

Acknowledgments

This study was derived from a thesis approved by the Faculty of Medicine. The authors express their gratitude to the Vice Chancellor for Research and Technology of Gonabad University of Medical Sciences, as well as to all nurses who participated in this study.

References

[1]. Zhang Y, ElGhaziri M, Nasuti S, Duffy JF. The comorbidity of musculoskeletal disorders and depression: associations with working conditions among hospital nurses. Workplace Health Saf. 2020;68(7):346-54. [DOI: 10.1177/2165079919897285] [PMID] [PMCID]

[2]. Rashidi R, Mohammadi R. Prevalence and risk factors of musculoskeletal disorders in nurses working in Khorramabad teaching hospitals in 1398. Yafte. 2021;23(1):1-11. [Link]

[3]. Nasiry Zarrin Ghabaee D, Haresabadi M, Bagheri Nesami M, Esmaeili R, Talebpour Amiri F. Musculoskeletal disorders in nurses and their relationship with occupation-related stress. J Mazandaran Univ Med Sci. 2016;25(132):91-102. [Link]

[4]. Bernal D, Campos-Serna J, Tobias A, Vargas-Prada S, Benavides FG, Serra C. Work-related psychosocial risk factors and musculoskeletal disorders in hospital nurses and nursing aides: a systematic review and meta-analysis. Int J Nurs Stud. 2015 Feb;52(2):635-48. [DOI: 10.1016/j.ijnurstu.2014.11.003] [PMID]

[5]. Abedi M, Kazemi SS. Work-related musculoskeletal disorders in nurses (Pictorial essay). Int J Musculoskelet Pain Prev. 2022;7(4):788-93. [DOI: 10.22034/ijmpp.7.4.788]

[6]. Jafari Roodbandi AS, Feyzi V, Foroozanfar Z, Rahimi Moghadam S. The correlation between ART and OCRA methods used for posture assessment of repetitive tasks. Med Lav. 2021;112(5):370-6. [DOI: 10.23749/mdl.v112i5.11117] [PMID] [PMCID]

[7]. Nützi M, Koch P, Baur H, Elfering A. Work–family conflict, task interruptions, and influence at work predict musculoskeletal pain in operating room nurses. Saf Health Work. 2015;6(4):329-37. [DOI: 10.1016/j.shaw.2015.07.011] [PMID] [PMCID]

[8]. Sahay S, Wei W. Work-family balance and managing spillover effects communicatively during COVID-19: nurses' perspectives. Health Commun. 2023;38(1):1-10. [DOI: 10.1080/10410236.2021.1923155] [PMID]

[9]. Ebrahimi E, Karimiankakolaki Z. Investigating the effect of family-work conflict on musculoskeletal disorders and the tendency to leave the job in the personnel of Social Security Hospitals in Chaharmahal and Bakhtiari Province in 2022. J Jiroft Univ Med Sci. 2023;10(1):1207-14. [Link]

[10]. Malakoutikhah M, Karimi A, Hoseini M, Rastgarkhaled A. Survey of the relationship between musculoskeletal disorders and work-family conflict in one of the country's steel industries. J Occup Hyg Eng. 2017;4(1):10-17. [DOI: 10.21859/johe-04012]

[11]. Indrawati R, Purwati WD. Work-family conflict on nurses' performance at private hospital in Jakarta. Int J Nurs Health Serv. 2022;5(2):159-66. [DOI:10.35654/ijnhs.v5i2.594]

[12]. Jafari N, Heidari A, Zhiani Asgharzadeh A, Khatirnamani Z. Investigating the relationship between work-family conflict and the desire to stay in the job from the perspective of employees of comprehensive health service centers in Gorgan. Sci J Nurs Midwifery Paramed Fac. 2022;7(4):77-90. [Link]

[13]. Sugawara N, Danjo K ,Furukori H, Sato Y, Tomita T, Fujii A, et al. Work–family conflict as a mediator between occupational stress and psychological health among mental health nurses in Japan. Neuropsychiatr Dis Treat. 2017;13:779-84. [DOI: 10.2147/NDT.S127053] [PMID] [PMCID]

[14]. Berkman LF, Liu SY, Hammer L, Moen P, Klein LC, Kelly E, et al. Work–family conflict, cardiometabolic risk, and sleep duration in nursing employees. J Occup Health Psychol. 2015;20(4):420-33. [DOI: 10.1037/a0039143] [PMID] [PMCID]

[15]. Obrenovic B, Jianguo D, Khudaykulov A, Khan MAS. Work-family conflict impact on psychological safety and psychological well-being: a job performance model. Front Psychol. 2020;11:475. [DOI: 10.3389/fpsyg.2020.00475] [PMID] [PMCID]

[16]. Ghasemi K, Miri M, Ramazani A, Norozi E. Investigating the individual and organizational factors related to work-family conflict in working women in Birjand in 2020. TB. 2021;20(3):50-58. [DOI:10.18502/tbj.v20i3.7463]

[17]. BorhanZehi K, Ebrahimi Rigi Z, YazdanParast E, Dadpishe S, Ebrahimi Rigi H. Investigation of the prevalence of musculoskeletal disorders and its relationship with negative affect in nurses: a descriptive-analytical study. Occup Med. 2021;13(1):42-52. [DOI:10.18502/tkj.v13i1.6581]

[18]. Parno A, Sayehmiri K, Parno M, Khandan M, Poursadeghiyan M, Maghsoudipour M, et al. The prevalence of occupational musculoskeletal disorders in Iran: a meta-analysis study. Work. 2017;58(2):203-14. [DOI: 10.3233/WOR-172619] [PMID]

[19]. Sun W, Yin L, Zhang T, Zhang H, Zhang R, Cai W. Prevalence of work-related musculoskeletal disorders among nurses: a meta-analysis. Iran J Public Health. 2023;52(3):463-75. [DOI: 10.18502/ijph.v52i3.12130] [PMID] [PMCID]

[20]. Hashemi Habybabady R, Dehbashi A, Paridokht F, Sepehr P, Maleki Roveshti M. Investigating occupational and personal factors effective in causing musculoskeletal disorders in the personnel of one of the hospitals in Zahedan city. TB. 2024;23(2):50-65. [DOI:10.18502/tbj.v23i2.16097]

[21]. Ahmadzadeh-Zeidi MJ, Rooddehghan Z, Haghani S. The relationship between work-family conflict and missed nursing care: a cross-sectional study in Iran. BMC Nurs. 2024;23:869. [DOI: 10.1186/s12912-024-02556-x] [PMID] [PMCID]

[22]. Bolandianbafghi S, Sharifi K. Work-family conflict in Iranian nurses: a systematic review. Iran J Nurs Res. 2020;14(6):53-60. [Link]

[23]. Mosadeghrad AM, Mojbafan A. Conflict and conflict management in hospitals. Int J Health Care Qual Assur. 2019;32(3):550-61. [DOI: 10.1108/IJHCQA-09-2017-0165] [PMID]

[24]. Hesabi M, Maghsoudi S, Emami Sigaroudi A, Kazemnejad Leili E, Monfared A. Work-family conflict among nurses working in Gilan University of Medical Sciences. J Women Soc Psychol Stud. 2015;13(4):123-52. [DOI: 10.22051/jwsps.2015.2243]

[25]. Imanipour M, Kamali H, Razzaghi Z. Work-family conflict in nurses during the COVID-19 pandemic. Health Dev J. 2022;11(4):174–9. [DOI: 10.34172/JHAD.92355]

[26]. Rokni M, Abadi MH, Saremi M, Mir Mohammadi MT. Prevalence of musculoskeletal disorders in nurses and its relationship with the knowledge of ergonomic and environmental factors. J Gorgan Univ Med Sci 2016;18(1):128-32. [Link]

[27]. Asghari E, Dianat I, Abdollahzadeh F, Mohammadi F, Asghari P, Asghari Jafarabadi M, et al. Musculoskeletal pain in operating

room nurses: associations with quality of work life, working posture, socio-demographic and job characteristics. Int J Ind Ergon. 2019;72:330-7. [DOI: 10.1016/j.ergon.2019.06.009]