Work-Related Musculoskeletal Disorders in Turkish Hospital Nurses

Hastanelerde Çalışan Türk Hemşirelerde Kas-İskelet Rahatsızlıkları

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ABSTRACT Objective: To determine the prevalence of work-related musculoskeletal disorders (WRMD) and the related factors in Turkish nurses. **Material and Methods:** The sample consisted of 2400 nurses working at hospitals in Istanbul. The study was conducted between January and May in 2008. A cross-sectional survey design was used. Data were collected by a questionnaire including personal, occupational variables, and WRMD. **Results:** Twelve-month prevalence was 79.5%. The highest prevalence was recorded for the lower back (49.7%), followed by shoulders (38%), and neck (35%). Nurses working in intensive care units were likely to suffer from WRMD more when compared to other nurses. The most common factors that led to or worsened WRMD were heavy lifting (92.3%), prolonged standing (89.8%), and bending (64.8%). Seventy percent of nurses with WRMD had visited a doctor, 47% took sick-day medical report, 4% of nurses reported that WRMD symptoms made them to modify their duties, and 32% of nurses reported that they would like to leave the occupation. **Conclusion:** This study supports that nurses in Turkey suffer from symptoms of WRMD due to work-related factors similar to their counterparts elsewhere. The results may contribute to plans for preventative strategies against WRMD in Turkey.

Key Words: Musculoskeletal diseases; nurses; prevalence

ÖZET Amaç: Türk hemşirelerinde işe bağlı kas-iskelet rahatsızlıkları ve ilgili faktörleri belirlemektir. **Gereç ve Yöntemler:** Çalışma İstanbul'da çeşitli hastanelerde çalışan 2400 hemşire üzerinde Ocak-Mayıs 2008 tarihleri arasında yapılmıştır. Kesitsel araştırma dizaynı kullanılmış, veriler kişisel, mesleki ve işe bağlı kas iskelet rahatsızlığını sorgulayan anket formu ile toplanmıştır. **Bulgular:** 12 aylık prevalans %79.5'dir. Prevalansı en yüksek olan bel rahatsızlığını (%49.7), omuz (%38) ve boyun (%35) rahatsızlıkları izlemiştir. Yoğun bakım ünitelerinde çalışan hemşireler diğer hemşirelere kıyasla daha fazla kas-iskelet rahatsızlığı yaşamaktadırlar. Kas-iskelet rahatsızlığına en sık yol açan faktörler ağır kaldırma (%92.3), uzun sure ayakta durma (%89.8) ve eğilmedir (%64.8). Hemşirelerin %70'i hekime başvurmuş, %47'si rapor almıştır, %4 oranındaki hemşire rahatsızlıkları nedeniyle görev değişikliği yapılmıştır. Hemşirelerin %32'si işinden ayrılmak istediklerini belirtmiştir. **Sonuç:** Bu çalışma sonuçları Türkiye'de hemşirelerin diğer ülkelerdeki meslektaşlarına benzer şekilde işe bağlı kas-iskelet sistemi rahatsızlıkları yaşadıklarını ve hemşirelerde kas-iskelet sistemi rahatsızlıklarına yol açan iş ile ilgili faktörlerin evrensel olduğunu göstermiştir. Çalışma sonuçları Türkiye'de işe bağlı kas-iskelet sistemi rahatsızlıklarını önlemeye yönelik planlamalara katkı sağlayabilir.

Anahtar Kelimeler: Kas-iskelet hastalıkları; hemşireler; prevalans

Work-related musculoskeletal disorder (WRMD) is a collective and descriptive term for symptoms caused or aggravated by work and it is characterized by discomfort, impairment, disability or persistent pain in joints, muscles, tendons, and other soft tissues, with or without physical manifestations.[1]

Nurses who work in health industry deal with many occupational health risks; the most common one being WRMD. For example, in the 12-month period, the prevalence of WRMD at any body region is reported as 62% to 93.6%.[2-8]

The nursing profession ranks the second after industrial work where physical workload is concerned.[9] Physically demanding nursing activities such as lifting heavy loads, working in awkward postures, transferring patients and other manual handling have implicated the WRMD in nurses.[10-13]

Despite the high incidence of WRMD worldwide, most epidemiological investigations among nurses have been restricted to high-income countries, and only one study with a small group has been conducted in Turkey.[14] Given that there are 71600 nurses currently working in Turkey,[15] we believe it is necessary to investigate WRMD in a larger group of nurses. Therefore, this study aims to investigate the prevalence of WRMD and the associated risk factors among Turkish hospital nurses and to compare the findings with the results of studies conducted in other countries.

MATERIAL AND METHODS

Before the research, approval from local ethics committee was obtained. The study was performed between January and May, in 2008. The sample consisted of 2400 hospital nurses from Istanbul, Turkey. These nurses had been working in their current jobs for at least one year, they did not report a non-work related injury/accident for up to 3 months before the onset of symptoms, and they volunteered to participate in the study. All participants were informed of the purpose of the study and were assured of the confidentiality. Informed consent was obtained from all subjects before their participation.

Information sample characteristics are summarized in Table 1. The mean age of participants was 32 years; most of them were married (62.4%); were employed as bedside/staff nurse (85%); and were working in medical departments (37%). Thirty five percent of them had a Bachelor's degree.

Data were collected with an anonymous 4-page questionnaire including questions about personal and occupational variables and WRMD. The personal variables were age, weight, height, smoking, marital status, and educational status. The occupational variables were primary work settings, position (bedside nurse/staff nurse vs. other), work shifts, length of work experience, and weekly working hours.

The operational definition of WRMD was having had a relevant symptom (pain, numbness, tingling, aching, stiffness, or burning) in the past 12 months. The nurses were asked whether they had experienced any WRMD-related symptoms. If the answer was yes, the nurse was asked to state the body region affected, whether there was any specific activity that led to it or worsened it such as bending and heavy lifting, whether medical care was taken, and what sort of treatment was recommended, whether there were sick days report as a result of WRMD, duration of sick days report, and any change or modification to their duties or job. The nurses were also asked whether they wanted to leave their occupation because of WRMD.

Questionnaires were distributed to nurses in each hospital department by chief nurses and collected within two days. SPSS 10.0 software was used to conduct statistical analysis.

Independent t-test was used to compare the presence of the pain and nurses' age, weight, height, duration of nursing experience, and weekly working hours. Chi-square test was used to estimate the relationship of pain with smoking (yes/no), marital status (married/unmarried), educational status (high school/university), primary working settings, current job position, and working shifts.

RESULTS

The 12-month prevalence rates of WRMD are presented in Table 2 by the body regions. The overall 12-month period prevalence of WRMD at any body region was 79.5%. The highest prevalence of WRMD cases was recorded for the lower back (49.7%), followed by shoulders (38%), and neck (35%). Three hundred twenty nine nurses reported WRMD at more than one body region.

TABLE 1: Personal and occupational information.			
	Mean (± SD)	Number	Percent (%)
Personal			
Age	32.0 (±5) years		
Weight	55.9 (±0.4) kg		
Height	161.3 (±8.1) cm		
Smoking (yes/no)		1000/1400	41.7/58.3
Marital status (married/unmarried)		1488/912	62.4/37.6
Educational status (high school/university)		840/1560	65.0/35.0
Occupational			
Nursing experience	10.3 (± 5.0) years		
Weekly working hours	45.9 (± 7.3)		
Primary work setting			
Medical wards		890	37.0
Intensive care units		427	17.8
Surgical wards		528	22.0
Others (Pediatrics, ophthalmology)		555	23.2
Current job position			
Bedside/staff nurse		2040	85.0
Nurse administrator		360	15.0
Working shift			
Day		487	20.3
Night		1368	57.0
Rotation		545	22.7

TABLE 2: Prevalence of WRMD cases in a single body region (N: 1915).		
	Prevalence of WRMD	
	Number	Percent (%)
Body Region		
Low back	952	49.7
Upper back	368	19.2
Neck	670	35.0
Shoulders	728	38.0
Back/neck/shoulders	262	13.7
Legs/Feet	575	30.0

WRMD: Work-related muscculloskeletal disorder.

The relationships between the prevalence rates of WRMD and independent variables were examined by Chi-square test and t test. The test results showed that primary work setting was the only independent variable that significantly affected WRMD prevalence rates (Chi square: 52.98, p< 0.01). Overall, while the rates for the intensive care units were higher than those for medical, surgical, psychiatry and other units, the rate of other units was the lowest. When odds ratio was calculated with respect to the other unit's rate which was the lowest value, the intensive care units showed high values of odds ratio (Table 3). There were significant differences between the prevalence rates by primary work settings (p< 0.01).

The factors that most frequently led to or worsened WRMD were heavy lifting (92.3%), prolonged standing (89.8%), and bending (64.8%). Excess workload on direct patient care (82%) and non-nursing related activities (secretariat, etc.) (20.9%) were also affected having WRMD.

Seventy percent of nurses with WRMD (N: 1340) had visited a doctor during the past year. They reported that they were prescribed medicine,

TABLE 3: Odds ratios with respect to other units.	
Primary work setting	**Odds ratio**
Medical	5.7
Intensive Care	7.0
Surgical	3.7

30% of them (N: 402) were recommended to receive physical therapy, 4% (N: 54) were recommended to undergo surgical intervention, and 47% (N: 630) took sick-day medical report. The duration of sick day's reports changed between three to 21 days (mean ± SD, 4.5 ± 2.1). On the other hand, of nurses who had visited the doctor, less than 4% reported that pain or discomfort due to WRMD had caused them to change or modify their duties or jobs. Thirty two percent of nurses with WRMD (N: 613) reported that they would like to leave the occupation in the near future if they can find a job not related to nursing.

DISCUSSION

The overall 12-month period prevalence of WRMD at any body region was found as 79.5% in this study. As such, the rate in our Turkish sample was lower than Swedish[2] (84%), Korean[4] (93.6%), Japanese[5] (85.5%) and Iranian studies[8] (84.4%). However, it was higher than other studies conducted on nurses in the United States[3] (72.5%), China[16] (70%) and the Greece and the Netherlands[6] (75 vs. 62%).

The lower back was most commonly reported body region in our study, affected in 49.7% of nurses. There is considerable amounts of international literature regarding lower back pain in nurses, and the 12-month period prevalence has been previously reported as follows: France 41.1%;[17] England 45%;[10] Sweden, 64%;[2] Hong Kong, 40.6 and 42.3%;[12,18] and the United states, 36.2%,[19] China, 56.7%;[16] Korea, 72.4%[4] and Japan, 59 and 71.3%.[5,20] The prevalence of lower back pain found in this study was within the ranges reported by the studies mentioned above.

The prevalence of shoulder disorders, which was the second most commonly reported condition in the current study, was 38% and this value was lower than that reported in an Australian research (60%);[21] a Swedish research (60%);[2] two Japanese researches (71.9%; 46.6%)[5,20] and a Korean research (74.5%);[4] but similar to a Chinese investigation (38.9%).[16] However, it was higher than that obtained in an American research (35.1%)[3] and a Hong Kong research (20.6%).[18]

WRMD of the neck represented the third most commonly reported condition among Turkish nurses, affecting 35% of them. The result found in this study is higher than the result obtained in a Japanese study (27.9%)[20] and a Hong Kong study (19.6%),[18] but lower than the ones obtained in a Korean study (62.7%)[4] and a Japanese study (54.7%).[5]

Thirty percent of nurses had WRMD related problems in their legs and feet. This result is similar to a study conducted in Hong Kong (29.9%).[18] In a Japanese study, knee and upper leg problems were reported at a percentage of 16.4% and 11.8% respectively;[20] while, in a Korean study the percentage of lower leg problems was found as 52.1% [4]

The prevalence of upper back disturbances, in the current study, was 19.2%. This result is similar to a study conducted in Australia (20%)[21] but lower than other studies carried out in Sweden (30%),[2] China (38.9%)[16] and Japan (33.9%).[5]

It is not possible to make a direct comparison between the aforementioned studies and ours when the definitions of WRMD, methodologies used, and the nursing populations chosen are taken into consideration. ThuWs, these results tend to suggest that WRMD of the neck, shoulder, lower back, upper back, and legs/feet vary among studies, WRMD constitutes a considerable burden for professional nurses over the world, including those in Turkey.

The relationships between the prevalence rates of WRMD and independent variables including demographic and employment characteristics were not found to be significant, except for primary working settings. This is in agreement with the findings of some studies mentioned below.[12,20-23] Yip reported that while the age and employment profile of current job position, educational level, and nursing and current ward experience was similar among the lower back pain and no pain groups, current working ward showed a significant effect on the incidence rate of low back pain.[12] Smith et al. found that the age of the nurses and duration of work was not significantly associated with the prevalence of lower back pain.[20] Lusted et al. indicated that variables of age, weight, smoking and years employed as a nurse were not significantly

related to the prevalence rates of musculoskeletal disorders.[21] Smith et al. pointed out that demographics of age, height, weight, body mass index, and workplace items of weekly hours, total years and bedside work did not significantly affect the prevalence rates of musculoskeletal disorder.[22] Kee and Seo showed that nurses in the surgical ward and intensive care units experienced higher rates of musculoskeletal disorders than those in other wards or units.[23]

The results of this study indicated that the nurses who work in the intensive care units were more likely to develop WRMD. This may be explained by the following reasons: (1) transferring, moving and lifting the patients, especially heavy or obese patients or patients unable to bear their own weights because of impaired conscious or medical reasons occurred more frequently in intensive care units; (2) nursing occupation is physically demanding, and patient handling, e.g. lifting, transferring and repositioning, was found to be an extremely hazardous job that had substantial risk for causing a musculoskeletal problems[3,10-13,24] (3) using mechanical patient lifts[13,25] or lifting teams[26,27] can help reducing musculoskeletal injury rates; (4) Unfortunately, in Turkey, most patient handling tasks such as transferring, repositioning, etc., have been manually performed by nurses, without using mechanical aids such as sling lift, ceiling lift, sit-to-stand lift or lifting teams.

In the current study, most nurses with WRMD reported that heavy lifting (92.3%), prolonged standing (89.8%), and bending (64.8%) were main factors causing or worsening WRMD. Our findings do not differ from those of other countries.

Nursing work is physically demanding,[3,13] bending, twisting, lifting heavy loads, transferring and moving patients, and other manual handling have a role in nurses' musculoskeletal, especially, back injuries.[10-13] Manual handling represents one of the most important ergonomic issues in nursing because staff must meet the demands of patients at any time. Furthermore, patient-related manual handling activities often need to be undertaken in less than ideal spaces and in suboptimal time frames.[28] In one study, nurses and nursing aides

were found to be at particular risk of back injury during patient transfer, which require sudden movements in non-neutral postures.[29]

Nurses, in our study, indicated that excess workload on direct patient care (82%) and non-nursing related activities (secretariat, etc.) (20.9%) were associated with their WRMD.

Lipscomb et al. found that increased workload and work complexity were associated with up to a 3-fold increase in neck and back musculoskeletal disorders.[30] In another study, work demands, consisting of both the requirements of the job and extra workload, were responsible for the depletion of human energy at work, resulting in fatigue and overexertion, and might consequently have risk associations with musculoskeletal outcomes.[18]

This is also in line with the theoretical reasoning of the work system compatibility theory advanced by Genaidy et al.[31] According to this theory, the higher the work system compatibility, defined as the degree of equilibrium between the energy expenditure and energy replenishment forces, the better the outcomes of human performance (fewer work accidents and illnesses; higher work productivity, and output quality).

In our study, 70% of nurses with WRMD visited a doctor at least once a year. This rate was higher than other studies.[3,23] Trinkoff et al. reported that 44.3%, 50.8% and 48.1% of the nurses with musculoskeletal disease had neck, shoulder and back problems, respectively;[3] Kee and Seo showed that more than half of nurses with WRMD had visited a doctor.[23]

In our study, all nurses who visited the doctor, were prescribed medicine, 30% of them were recommended to have physical therapy, and 4% were recommended to undergo surgical intervention. There was a big difference in the proportion of Turkish nurses with WRMD symptoms who reported that they had reduced or modified their work activities with studies among nurses from the USA.[3] In the present study, less than 4% of Turkish nurses with WRMD had reduced or modified their work activities, while 30.8-46.8% of American nurses with musculoskeletal complaints had done

so.[3] This may indicate that while Turkish nurses with musculoskeletal complaints had made an effort such as visiting a doctor, taking medicine, or going to physical therapy to alleviate or cure the symptoms, hospital managements took very few measures to prevent WRMD such as reducing/modifying nurses' work or doing job rotations, compared to the USA. [3]

Besides the personal suffering, WRMD's economic burden is huge because it is the major cause for health-related absenteeism and early retirement. In Germany, for example, data from a major health insurance company indicate that 56% of reported sick days of nurses in in-patient units is due to WRMD.[32] Similar rates regarding the consequences of back pain have been reported in the USA, the UK and the Netherlands.[33-35] Owen found that 20% of nurses had changed their at least once due to a musculoskeletal problem.[36] Finally, back complaints are recognized in the long runas a leading cause for early retirement. In a survey of 43 000 nurses in five countries, 17% to 39% reported that they planned to leave their occupation in the next year due to the physical and psychological demands of the profession.[7] Because nurses are already at risk for WRMD, a reduction in professional nursing staff are likely to lead to even higher rates of these disorders. The Minnesota Nurses Association found that when registered nurse positions in hospitals decreased by 9%, the number of work-related injuries or illnesses among registered nurses increased by 65%.[37]

Turkey has relatively few nurses compared to other countries, with the lowest figure among the 51 countries in the WHO's European Region. The number of registered nurses per 1000 persons in Turkey (2.4 nurses) is less than that of Germany (9.5 nurses), Sweden (8.4 nurses), Austria (5.8 nurses), Spain (3.7 nurses), and Bulgaria (4.5 nurses).[15] In our study, nearly half of nurses who visited a doctor because of WRMD, got sick-days medical report. The duration of the medical reports changed between three and 21 days. Thirty two percent of nurses with WRMD would like to leave occupation in the near future if they find another job to live on. These findings are particularly dis-turbing given the current shortage of nurses in Turkey and the increasing need for nursing care projected over the next decade.

CONCLUSION

In conclusion, this study reveals that the prevalence of WRMD in Turkish nurses is similar to the rates reported in other countries. Work setting was the only independent variable that affected prevalence of WRMD (Chi square: 52.98, p< 0.01). Nurses working in intensive care units were likely to have more WRMD compared to other nurses (odds ratio: 7.0). The factors that most frequently led to or worsened WRMD were heavy lifting (92.3%), prolonged standing (89.8%), and bending (64.8%). Nurses also indicated that excess workload on direct patient care (82%) and non nursing related activities (secretariat, etc.) (20.9%) were associated with their WRMD. Thirty two percent of nurses with WRMD (N: 613) reported that they would like to leave the occupation in the near future if they can find a job not related to nursing. We believe that study results will contribute to take preventative strategies against WRMD in Turkey.

STUDY LIMITATIONS

This study reveals that the rate of WRMD in Turkish nurses is similar to the rates reported in other countries. It must be kept in mind that findings reported herein are preliminary because they are limited by the cross-sectional design of this investigation and are self-reported. This study was limited to the current workforce; nurses who no longer worked in nursing because of WRMD or other health conditions were not included. The absence of these individuals from the study population might have underestimated the prevalence of WRMD and the association of the job-related factors with a WRMD.

The exclusive use of self-reported data may be another limitation for this study. The self-reports used may create an observation bias for a potential of negative reporting (i.e., nurses with negative mood may perceive their environment more negatively), creating an artificial correlation between work environment and WRMD.

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