Prévalence et facteurs de risque des troubles musculo-squelettiques chez les infirmiers Tunisiens

Prevalence and risk factors of musculoskeletal disorders among Tunisian nurses

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RÉSUMÉ

Introduction : Les troubles musculo-squelettiques (TMS) représentent actuellement la première maladie professionnelle indemnisable en Tunisie et dans plusieurs pays du monde.

But: Évaluer la prévalence des problèmes musculo-squelettiques et rechercher des relations avec les caractéristiques individuelles et les facteurs de risque liés au travail chez les infirmiers des deux CHU de Sousse.

Méthodes: Il s'agit d'une étude descriptive-corrélationnelle basée sur un questionnaire auto-administré destiné à tous les infirmiers travaillant dans les deux Centres Hospitalo-Universitaires de Sousse. Le risque potentiel de trouble musculo-squelettique a été examiné par régression logistique.

Résultats: La prévalence des TMS au cours des 12 derniers mois était de 48,1%. Il s'agissait principalement de lombalgies (68,5%), dorsalgies (36,9%) et gonalgies (34,5%). A l'étude univariée, les TMS étaient associés au genre féminin (p=0,01), à l'état célibataire (p=0,013), à l'IMC élevé (p<0,001), à l'ancienneté dans l'établissement (p=0,001), les gestes répétitifs (p=0,004), la position debout (p=0,007), les efforts physiques intenses (p<0,001), le port de charges lourdes (p=0,002), position inconfortable (p=0,008) ainsi que le soutien social faible (p<0,001). La régression logistique a montré que les troubles musculo-squelettiques étaient significativement associés àl'effort physique intense (OR=7,72 ; IC à 95% [2.98 – 19.97]) et au job strain (OR=3,24 ; IC à 95% [2.98 – 19.97]).

Conclusion: La prévalence des TMS était élevée chez le personnel infirmier compte tenu de la douleur lombaire le plus souvent affectée. L'information et la formation du cadre paramédical sur les facteurs de risques et la prévention des problèmes musculo-squelettiques sont recommandées afin de réduire leur survenue et même de favoriser la performance des soins aux patients.

Mot clés : Prévalence, Troubles musculo-squelettiques, personnel infirmier, Facteurs psychosociaux, Facteurs physiques

SUMMARY

Background: Musculoskeletal problems depict essentially the most worrying difficulties inside work health today.

Aims: To evaluate the prevalence of musculoskeltal issues and to search relationships with individual characteristics and work-related risk factors among two public hospitals nurses in Sousse.

Methods: It is a descriptive-correlational investigation based on a self-administered questionnaire destined for all nurses working in two public hospitals of Sousse. The potential risk of musculoskeletal issues was examined by logistical regression.

Results: The prevalence of musculoskeletal disorders (MSD) over the last twelve months was 48.1%. Musculoskeletal problems developed mainly in low back (68.5%), upper back (36.9%), and knees (34.5%). The Chi-square test indicated that MSD is associated with female gender (p = 0.01), being single (p = 0.013), high BMI (p <0.001), seniority (p = 0.001), repetitive work (p = 0.004), prolonged standing position (p = 0.007), intense physical effort (p <0.001), lifting heavy loads (p = 0.002), uncomfortable position (p = 0.008) and low social support (p <0.001). The logistic regression analysis showed that intense physical exertion (OR= 7.72, 95% CI: 2.98 – 19.97) and job-strain (OR= 3.24, 95% CI: 2.98 – 19.97) represent risk factors related to MSD.

Conclusion: A high amount of Tunisian nursing staff in this survey complained of musculoskeletal issues considering the low back pain most often affected. Education courses on prevention and coping approaches for musculoskeletal problems are appropriate for nurses as a way to minimize the rate of work risks and even promote performance patient care.

Key words: Prevalence, Work-related musculoskeletal disorders, nurses, Psychosocial Factors, Physical Factors

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INTRODUCTION

Work-related musculoskeletal disorders (WRMSD) present a serious public health and socioeconomic difficulties all over the world [1]. Many epidemiological studies have attempted to demonstrate that nursing professionals are at greater risk of encountering musculoskeletal disorders (MSD) compared to other sorts of occupational groups [2-5].Based on Wiitavaara et al., numerous studies conducted among nurses evidenced the high prevalences of MSD, ranging from 62% to 89% [6]. It is asserted that physical work activities, consisting of patient-handling duties, place nurses vulnerable to obtaining MSD [5]. MSD are likewise among the principal causes of long-term sick leave and even early retirement amongst health care personnel [4, 6].Historically,Low back pain (LBP) is the most widespread work-related MSD and also the most often reported musculoskeletal injuries for nurses in different parts of the world[2,7,8]. An increased prevalence of LBP is frequently noted among nursing staff compared with other employees [1]. LBP is a serious health problem due to the consequences of impairment, the employment of health services, and also illness absence [9].

Numerous occupational components have been recongnized as essential risk factors for MSD for various jobs; however, among health care professionals, both physical and psychosocial factors are generally approved as main hazard factors [6, 8, 9]. Physical risk factors involve manual handling, maintain an inappropriate posture, regular bending and twisting, raising, and also forceful activities [4-6]; although psychosocial factors consist of low work pleasure, weak social support, and psychological high demandare also included [9,10].

In the scientific literature, MSD have a notable position in the field of work health [5]; however this has not been the case in Tunisia.To our knowledge, very few reaserch has aimed at the relationship between working conditions and MSD complaints among nursing personnel.

The purposes of this cross-sectional survey were the description of the prevalence of MSD during the previous 12 months among two public hospitals nurses in Sousse (Tunisia) and to look for relationships with individual characteristics and work-related risk factors.

METHODS

This is a cross-sectional descriptive investigation carried out among 310 nurses working in two public Hospitals (Farhat Hached and Sahloul) of Sousse and that took place between January and April 2017.Nurses who having working experience of 1 year or more were included. Nurses confirming as getting congenital deformities, traumatic conditions, neurological conditions, and gynecological conditions were ommitted from the study. A verbal informed permission was obtained from the participants who chosen not to have a written informed consent for reasons about anonymity.

The data collection constructed from four important parts.

The first section allowed collecting the demographic information such as age, gender, weight, height, Body Mass Index (BMI), life-style habits (like smoking and physical exercise), marital status, and number of children.

The second section concentrated on employment information that inculde shift work and seniority in the establishment. Additional items covered their daily physical duties, working postures, handling of objects, lifting, moving patients, etc. Participants were questioned to grade the frequency of daily activities reported by four modalities: (1) never, (2) rare: less than 2 hours per day, (3): often: 2 to 4 hours per day, (4) always. For the analysis, the modalities (1) et (2) was considered rare and (3) et (4) was considered frequent.

The Borg CR-20 scale was used as a subjective evaluation of physical workload [11]. It is a visual scale analyzing the effort intensity integrated during the work activity. The scale proposes a rating of the effort from the value 6 (low physical effort) to 20 (very hard). The variable was dichotomized to the threshold value(<15: low physical effort, ≥ 15 intense physical effort).

A detail of various psychosocial demands at work covered the third part, and was taken from the Job Content Questionnaire (JCQ) [12]. An overall of 29 items from the JCQ that comprised three subscales: decision latitude; social support from supervisors and colleagues and psychological demand. The reponse categories were scored using a Likert scale, ranging from 1 (strongly disagree) to 4 (strongly agree).To evaluate psychological scores, the median values of the study for decision latitude,psychological demand and social support were utilised to dichotomize the scale into two classes (high/

low).The Job strain was defined by high psychological demand × low decision latitude and the iso strain was found the combination effects of job strain and low social support.

The last section contained questions about symptoms of work-related MSD at any body areas and was adapted from the Standardized Nordic Musculoskeletal Questionnaire (SNMQ) [13].

In our analyze, nurses who presenting any kind of symptoms such as pain, ache, numbness, burning, swelling or discomfort during the past one year and scored pain intensity of at least three on a 5 point scale (moderate) in at least one body area that persisted at least seven days or appeared monthly, were defined as having MSD.

Statistical analysis

Data were examined using the IBM SPSS version 20.0. Descriptive statistics such as the frequencies, percentages, mean and standard deviation were used to describe the demographic and work-related information. MSD were assumed as the dependent variable. Demographic and employmenet characteristics were defined as independent variables. Chi-square and logistic regression were used to look for the associations between the prevalence of MSD and the independent variables. The inclusion of independent variables in the regression models was done when their degree of significance was inferior to 0.2. For all statistical tests, level of significance was fixed at 0.05.

RESULTS

Socio-professional characteristics

Of the 325 returned surveys, 15 were disqualified as invalid because of a number of unanswered questions and/or impossible responses, with a participation rate of 95% (310/325). Of the 310 respondents, 142 (45.8%) were male. The average age of the respondents was 41.42 ± 5.7 years with extremes varying between 27 to 56 years. Their mean height (in kg), weight (in cm) and BMI (in kg/m2) were 70.03 ± 6.58, 165 ± 5.9 and 25.71 ± 2.24, respectively. Of these subjects, 162 (52.3%) were overweight with a BMI (≥25 kg/m2). Majorities (97.7%) of nurses were married. The average seniority in the current estabishment was 8.19 ± 3.9 years.Table 1 summarizes socio-demographic and occupational characteristics of the nurses who participated in the study.

Table 1. Socio-demographic and occupational items of the study population (n = 310)

Gender (%)	Man/Woman	45.8 / 54.2
Age (Years)	mean± SD	41.42 ± 5.7
Weight (kg)	mean± SD	70.03 ± 6.58
Height (cm)	mean± SD	165 ± 5.9
BMI (kg/m2)	mean± SD	25.71 ± 2.24
Seniority (Years)	mean± SD	8.19 ± 3.9
Sports activity (%)	Yes/No	5.8 / 94.2
Smoking(%)	Yes/No	17.1 / 82.9
Working schedule (%)	Fixed /Shifts	44.5 / 55.5
Marital status (%)	Single /Married	2.9 / 97.7
Number of children (%)	≤2 / >2	74.8 / 24.5

BMI : Body Mass Index

Prevalence of MSD symptoms

During the last 12 months preceding the survey, 48.1% of the nurses reported experiencing musculoskeletal discomfort. The corresponding prevalence was 38.3% for men and 61.7% for women. 61% of respondents had reported MSD at ≥2 anatomical sites in the past year. Of these, only 31.9% and 27.5% had MSDs in two and three separate sites of the body respectively.

By individual body site, lower back pain was the most prevalent MSD (68.5%) and hip and thigh were the least (0.7%) frequent sites during the last year. Table 2 presents the 12-month prevalence of musculoskeletal complaints prior to the study.

Table 2. Prevalence of Musculoskeletal problems in different body regions over the past 12 months prior to the study (n = 149)

Body region	Frequency	Percentage (%)
Neck	42	28.2
Shoulders	32	21.5
Elbows	30	20.1
Hands/wrists	27	18.1
Ankles /feet	31	20.8
Upper back	55	36.9
Lower back	102	68.5
Knees	51	34.5
Hips/thighs	1	0.7

Risk factors associated with MSD

· *Individuals factors*

In univariate analysis, individual factors were female gender (p = 0.01) and being single (p = 0.013) and nurses with a high BMI (p <0.001) is significantly related to MSD in our study. (Table 3)

· *Occupational factors*

The physical factors statistically linked to MSD were the seniority in the establishment (p<0.001), repetitive movement (P = 0.004), prolonged standing position (p = 0.007), high intensity of effort (p <0.001), lifting heavy load (p = 0.002) and uncomfortable positions (p = 0.008). MSDs was significantly related to the low of social support (p <0.001). Decision latitude and psychological demand were not found to be related to MSD.Table 5 summerized the findings of the association between the psychosocial work characteristics and MSD.

Multivariate analysis

The results of multiple logistic regression analysis explored that intense physical effort (OR= 7.72, 95% CI: 2.98, 19.97) and the job strain (OR= 3.24, 95% CI: 1.70, 6.19) had significantly increasing odds in respondents with reported MSD.

Table 3. Relations between individual factors and musculoskeletal disorders (Univariate analysis)

Variables	Musculoskeletal disorders		p-value[a]
	Yes (n=149)	No (n=161)	
Sex			
Male (n=142)	57 (40.1%)	85 (59.9%)	
Female (n=168)	92 (54.8%)	76 (45.2%)	p=0.010
Age			
<45 years (n=210)	93 (44.3%)	117 (55.7 %)	
≥45 years (n=100)	56 (56%)	44 (44%)	p= 0.054
Marital status			
Single (n=9)	8 (88.9 %)	1 (11.1%)	p=0.013
Married (n=301)	141 (46.8 %)	160 (53.2%)	
Number of children			
≤ 2 (n=232)	113 (48.7%)	119 (51.3%)	P=0.83
> 2 (n=76)	36 (47.4%)	40 (52.6%)	
Smoking			
Yes (n=53)	31(58.5 %)	22 (41.5%)	P=0.095
No (n=257)	118 (45.9%)	139 (54.1%)	
Sports activity			
Yes (n=18)	10 (55.6%)	8 (44.4%)	P=0.51
No (n=292)	139 (47.6%)	153 (52.4%)	
BMI			
>25 (n=148)	50 (33.8%)	98 (66.2%)	
≥25 (n=162)	99 (61.1%)	63 (38.9%)	p<0,001

a)Chi-square test between the two groups (with and without MSDs) ; BMI : Body Mass Index

Table 4. Relations between work-related and musculoskeletal complaints
(Univariate analysis)

Variables	Musculoskeletal disorders		p-value[a]
	Yes (n=149)	No (n=161)	
Seniority			
<10 years (n=215)	86 (40%)	129 (60%)	
≥10 years (n=95)	63 (66.3%)	32 (33.7%)	p<0,001
Work system			
Fixe (n=138)	67 (48.6%)	71(51.4%)	P=0.87
Shifts (n=172)	82 (47.7%)	90 (52.3%)	
Repetitve mouvement			
Rare (n=147)	58 (39.5%)	89 (60.5 %)	
Frequent (n=163)	91 (55.8%)	72 (44.2%)	p= 0.004
Standing position			
Rare (n=89)	32 (36 %)	57 (64%)	
Frequent (n=221)	117(52.9%)	104 (47.1%)	p=0.007
Intensity of exertion			
score > 15 (n=71)	53 (64.6%)	18 (25.4%)	p<0,001
score ≤15 (n=239)	96 (40.2%)	143 (59.8%)	
Awkward posture			
Rare (n=263)	118(44.9%)	145 (55.1%)	
Frequent (n=47)	31 (66%)	16 (34%)	p=0.008
Lifting heavy objects			
Rare (n=126)	47 (37.3%)	79 (44.4%)	
Frequent (n=184)	139(55.4%)	82(44.6%)	p=0.002

a)Chi-square test between the two groups (with and without MSDs)

Table 5. Association between psychosocial work characteristics and the prevalence of MSD

Variables	Musculoskeletal disorders		p-value[a]
	Yes (n=149)	No (n=161)	
Psychological demand			
Low (n=10)	53(53%)	47(47%)	P=0.23
High(n=210)	96(45.7%)	114(54.3%)	
Decision latitude			
Low(n=176)	83(47.2%)	93(52.8%)	
High (n=134)	66(49.3%)	68(50.7%)	P=0.71
Social support			
Low(n=194)	117(60.3%)	77(39.7%)	P< 0,001
High (n=116)	32(27.6%)	84(72.4%)	
Iso-strain			
Yes(n=48)	29(60.4%)	19(39.6%)	P=0.062
No (n=262)	120(45.8%)	142(54.2)	
Job-strain			
Yes(n=108)	44(40.7%)	64(59.3%)	P = 0.059
No (n=202)	105(52%)	97(48%)	

a)Chi-square test between the two groups (with and without MSDs)

DISCUSSION

This cross-sectional investigation attempted to explore the prevalence and risk factors associated with work-related MSDs among public hospital nurses in Sousse.

The current study revealed that majority of nurses (48.1%) complained of MSD during the past 12 months.The prevalence rate of this investigation is lower compared to those noted amongst nursing personnel who were questioned by using exactly the same customer survey (SNMQ) inthe epidemiological studies; the estimates varying from 81% to 95% in Iran[14, 15], Japan [2], Estonia [16] and Brazil [17]. However, it was basically greater to the prevalence rates showed in some othersin Pakistani hospital nursing staff (31.6%) [18] and Indian nurses (41%) [19].This divergence in MSD prevalence rates reported in the literature can be explained by subjectivity of terms, organizational differences in work settings, and cultural differences in the perception and reporting of pain and disorders are adduced for the variation in rates of WMSDs in the different studies.

Low back complaints rate was basically 68.5% in our nursing population during the last year. Many studies and systematic reviews have reported the lower back as an often affected region among nursing staff. Low Back pain (LBP) is known as a frequent work-related problem for nurses worldwide, and has already been previously showed at rates around 45% in England [20], 63% in Australia [21] and 64% in Sweden [22].Our findings were comparable with those of Tinubu et al.[23] and Fabunmi et al. [24] who respectively reported prevalence of 44.1% and 79.4 %. MSD of the upper back was in fact the second most frequently reported musculoskeletal complaint among the nursing staff studied (36.9%). In our series, the findings were similar to a China study (37%) [25], but lower than those reported among Sweden nurses (30%) [22]. The third most frequently reported MSDs was in the knees (34.5%).It was in a considerable range observed among nursing personnel in Estonie (32.6%) and Uganda (37%) [16, 26].

Furthermore, for the last twelve months to this research,around 31.9% of the studied nurses reported symptoms of MSD in juste one anatomical site that were lower compared to those noted among American nurses (35%) [27]. At the same time, a vast majority of participants (61%) experienced MSD in the multisite of body area during the last 12 months, similar to the Estonian nurses (60%) [16].

For this population we determined that MSD were significantly related to gender (p=0.01), marital status(p=0.013) and high BMI (p <0.001).Many studies indicate that women have a more significant musculoskeletal morbidity than men [14, 28].As the majority of our participants weightis at the over weight range, BMI was linked with MSD. Our results resemble that from Trinkoff et al. [15] who reported an important relationship between BMI and MSD. The study findings also showed that being single was significantly linked with the prevalence of MSD.Our study demonstrated the difficulty of studying the correlation between marital status and MSD among nursing staff due to the low percentage of single in our sample.Tobacco smoking habit has recently been pointed out as an associated risk factor in the literature,indicating a possible association with MSD. In a study carried out among French nurses, Niedhammer et al.[29] determined that tobacco usershad been 1.97 times very likely to experience back pain in comparison with their non-smoking colleagues.In our investigation, smoking cigarettes did not appear to be related to MSD (p>0.05). This deviance is related to the low number of people who smoke among the respondents in the present study (17.1%).Aside from these personal factors, a number of professional risk factors can influence MSD frequency in ourresearch.There was major interrelationship between seniority and MSD (p<0.001). Comparable results were additionallyobserved in the investigation by Tinubu et al. among Nigerian nurses [24].The statistical analysis of our study demonstrated that physical factors such aslifting heavy loads, uncomfortable position, static posture,repetitive mouvement and intensive physical hard workwere significantly associated with MSD. This is in agreement with the data of the literature [15, 30]. The studies in healthcare domain have revealed the risk of patient-handling activities which surpass body tolerances [31] .Our answers are in according to the results of a research done on Italian X-ray technologists in which physical amount of work was seen to be associated with frequency of MSD [32].

Psychosocial factors are actually recognized asstrong problems of MSD [33,34].The findings of our study proved that poor work support was found to be an important psychosocial risk element for MSD among Tunisian nurses, a result that has beenwas comparable to some

previous research executed in China [34].Nevertheless, the results of Campbell et al. [35]indicated that there was no influence of co-worker ordirector on getting MSD.

Multiple logistic regression analysis reveals that job-strain represent significant risk factors correlated to MSD (OR= 3.24, 95% CI: 1.70, 6.19).However, Bongers et al. [34] are finding contradicted evidences on the relationship between job strain and musculoskeletal complaints.There are restricted information concerning the association of work-related psychosocial factors and MSD throughout hospital nurses and the majority of therecent studies in the littrature centered on physical demands.

It is important to note that the current researchhas limitations.First,it is a cross-sectional survey where it is difficult to establish a causal link between the different factors.Health information based on workers' self-report, a common procedure in epidemiologic studies, can motivate some criticism concerningloss of objectivity.

CONCLUSION

In conclusion, the results of this research reconfirmed the higher prevalence of work-related MSD among hospital nurses andinsisted onthe value of physical or psychological factors of work in relation with MSD. Essentially the most essential cause for this kind of MSD might be sufficient of education to understand of the associated work-related situations. However, interventions to minimize MSD in hospitals should take into account not only ergonomics, but also the improvement of organizational aspects of the work environment.

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