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Work Related Musculoskeletal Disorder among Egyptian Physiotherapists

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ABSTRACT

Background: Physiotherapists are known to be prone to work related musculoskeletal disorder but its prevalence among physiotherapists in Egypt has not been reported. **Purpose:** To study the prevalence of work related musculoskeletal disorders and to investigate relationship between physical risk factors and musculoskeletal disorders among Egyptian physical therapist in the previous 12 month. **Material and Methods:** 400 physiotherapists' volunteers with ethical approval and informed consent as a convenience sample were recruited from some educational and public Cairo hospitals to assess musculoskeletal disorder due to work in the last 12 months. The participants were asked to answer Modified Nordic questionnaire. **Results:** Reported 12 months prevalence of work related musculoskeletal disorders among Egyptian physiotherapist was 90.7%. Prevalence was significantly higher in spine and upper limb. The back disorders with a percentage of 61.8% was the most commonly affected part. Injury occurred during first ten years after graduation with high prevalence in upper limb with a percentage of 78.6%, the highest prevalence was found among physiotherapist younger than 30 years old. Treating large number of patients were significantly related to upper limb, lower limb and back injury. **Conclusion:** The coping strategies and work factors of work related musculoskeletal disorders among Egyptian physiotherapists are mostly similar to those of their counterparts elsewhere. The prevalence of work related musculoskeletal disorders among physiotherapists in Egypt is higher than most values reported for their counterparts in other countries.

Key words: work related musculoskeletal disorder, Modified Nordic questionnaire.

INTRODUCTION

Work related musculoskeletal disorders have been described as the most notorious and common causes of severe long term pain and physical disability that affect hundreds of millions people across the world^{12,17} and it is an umbrella term for which repetitive strain injury, repetitive trauma disorder and cumulative trauma disorder are all used interchangeably²⁵. It represent a major economic burden on society in terms of decrease productivity and personal suffering¹⁰.

The work related musculoskeletal disorders was more specifically defined as "disorders of the muscles, nerves, tendons, ligaments, joints, cartilage, blood vessels or spinal disks in the neck, back, shoulder, elbow, forearm, wrist, hand, abdomen (hernia only), knee, ankle and foot associated with exposure to risk factors"³. Pain is the most common symptom associated with work related musculoskeletal disorders. In some cases there may be joint stiffness, muscle tightness, redness and swelling of the affected area. Some workers may also experience sensations of "pins and needles", numbness, skin color changes, and decreased sweating of the hand²⁴.

In the work place, the health care professionals are vulnerable to sustaining musculoskeletal disorders during the course of their work routine. These types of injuries are common among physiotherapists because the nature of their profession^{15,16,22} which is often lifting the patients, bending, twisting, stooping, carrying, pushing or pulling, prolonged standing, working in a hospital setting and using manual therapy techniques.

SUBJECTS AND METHODS

This work tasks put therapists at risk for both acute and cumulative musculoskeletal pain^{6,20}.

Most of literature used the survey method to ascertain the occupational health problems and risk factors within a population. A self-administered questionnaire is a valid and relatively inexpensive way to establish baseline risk identification information for an occupational group^{2,13}. Standardized Nordic Musculoskeletal Questionnaire that is a valid and reliable questionnaire^{18,28} was developed from a project funded by the Nordic Council of Ministers, because they needed standardized questionnaire methodology allowing comparison of low back, neck, shoulder and general complaints for use in epidemiological studies^{8,18,21,28}. Standardized Nordic Musculoskeletal Questionnaire was used in many different studies assessing work related musculoskeletal disorders among physiotherapists as in turkey²⁴, in Kuwait¹³ and in North and Central Queensland²⁷.

Documentation of the musculoskeletal disorders associated with physiotherapists work allows the prediction of musculoskeletal disorders related to physiotherapists work so paves the way to prevention and intervention strategies, and to improve performance of physiotherapists in treating patients who may be affected by physiotherapists disorders^{2,13,17,19,27}. In spite of the prevalence of musculoskeletal disorders among physiotherapists all over the world is well documented as in Izmir-Turkey²⁴, Nigeria², North and Central Queensland²⁷, Kuwait¹³ and Canada¹⁹ and it shows great difference from country to another, the prevalence of work related musculoskeletal disorders among Egyptian physiotherapists is not documented yet.

So, the purposes of the study were to study the prevalence of work related musculoskeletal disorders among Egyptian physiotherapists, and to investigate the relationship between physical risk factors and musculoskeletal disorders among them in the previous 12 month. This documentation provides data about job tasks which may increase the risk of work related musculoskeletal disorders. It also provides data about effect of specific risk factors.

Subjects' selection

This study was approved by the Ethical Committee of the Faculty of Physical Therapy; Cairo University. Four hundred (203 male and 197 female) physiotherapists participated in the study. They were selected by using convenience sampling technique from educational and general hospitals in Cairo, Egypt⁹. Subjects were included if their age ranged between 21 and 50, working in Cairo, Egypt, and their experience from 1 to 30 years. The exclusion criteria for participants were musculoskeletal abnormalities due to other causes than work related (i.e. congenital, traumatic) or previous operation involving locomotors system.

Design of the study

The cross - sectional study design was used to study the prevalence of work related musculoskeletal disorders among Egyptian physical therapists and to investigate relationship physical risk factors and musculoskeletal disorders. The sample size was estimated after conducting power analysis based on the results of the previous studies.

Methods

Modified Nordic questionnaire which is a valid, reliable, multiple parts and self-administered questionnaire^{13,18} was used in this study. The questionnaire had four parts. Part one collected the participant's personal characteristics that include age, gender, family history, and physical activity habits. Part two collected information on the participant's education and current work history. Part three collected information on physical risk factors associated with physiotherapy work. Part four assisted occurrence of musculoskeletal complaints. The questionnaire divided human body into three anatomical regions, the upper limb regions which consist of shoulder, elbow and wrist, the lower limb regions which consist of hip, knee and ankle and back regions which consist of cervical, upper back and lower back. It also includes a diagrams with the three anatomical regions clearly marked^{18,28}.

Procedure

Four hundred copies of the questionnaire were given to the participant physiotherapists who work in educational and general hospitals in Cairo, Egypt. They were asked to answer the questionnaire honestly. Participants were asked whether they have or have had troubles in the indicated areas during the preceding 12 months.

Data analysis and statistical design

The SPSS (version 17) statistical software package was used for all analyses. Descriptive statistics was used to estimate the prevalence of work related musculoskeletal disorders and demographic characteristics and physical risk factors. Frequencies and cross-tabulations were used to compare musculoskeletal disorders prevalence and demographics, work history and physical risk

factors. Chi-square tests were used to assess the relationship between work related musculoskeletal disorders and physiotherapists characteristic and between musculoskeletal disorders and physical risk factors of work. The Level of significance was set at $P > 0.05$.

RESULTS

Physiotherapist's characteristics

There were 203 (50.75%) male and 197 (49.25%) female physiotherapists participated in this study. Their age ranged between 21 and 50 years. The physiotherapist's characteristics (age groups, professional experiences, working sitting, body mass index, and the number of treated patients per day) of the participant were summarized in table (1).

Table (1): Characteristics description of participants.

Items	No.	%
Sex		
-Male	203	50.75%
-Female	197	49.25%
Age groups (yrs.)		
-21-30	253	63.25%
-31-40	105	26.25%
-41-50	42	10.5%
Professional experience(yrs.)		
-1-10	309	77.25%
-11-20	64	16%
-21-30	27	6.75%
Work sitting		
-Educational hospital	158	39.5%
-General hospital	242	60.5%
Body mass index		
-Less than 18.5	16	4%
-18.5-25	166	41.5%
-25.1-30	137	34.25%
-More than 30	81	20.25%
Number of patients/day		
-0-20	303	75.75%
-21-30	59	14.75%
-31-40	34	8.5%
-41-50	4	1%

yrs: years

Prevalence of Work Related Musculoskeletal Disorder among Egyptian Physiotherapists

Out of 400 physiotherapists participated in the study, there were 363 physiotherapists

with a percentage 90.8 % had work related musculoskeletal disorders and 37 physiotherapists with a percentage 9.3 % did not had musculoskeletal disorders. There were a significant relationship between

physiotherapists work and musculoskeletal disorders. P-value was 0.0001, table (2).

There were 224 (56%) physiotherapists had upper limb injury, 87 (21.8%) physiotherapists had lower limb injury and 247 (61.8%) physiotherapists had back injury.

There were a significant relationship between physiotherapists work and upper limb, lower limb, and back musculoskeletal disorders as P-value was 0.01, 0.0001, 0.0001 respectively table (2) and figure (1).

Table (2): Prevalence of Work Related Musculoskeletal Disorders among Egyptian Physiotherapists in Egypt.

Work related musculoskeletal disorder	No. Have injury	%	No. Have no Injury	%	P-value
Total	363	90.8%	37	9.3%	0.0001
Upper limb	224	56.0%	176	44.0%	0.01
Lower limb	87	21.8%	313	78.3%	0.0001
Back	247	61.8%	153	38.3%	0.0001

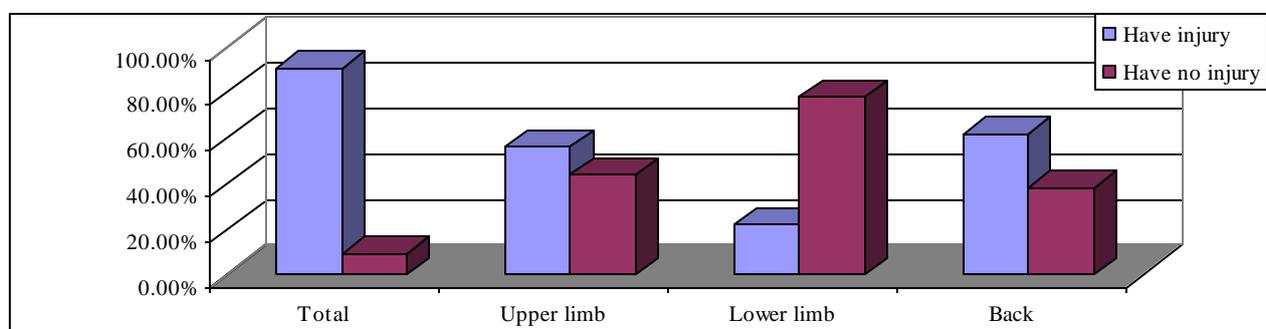


Fig. (1): Prevalence of work related musculoskeletal disorders among Egyptian physiotherapists.

Characteristics of work related musculoskeletal disorders

The physiotherapists suffering from upper limb were 224 with percentage of 56.0%. From the 224 physiotherapists, table (2) there were 153 physiotherapists with percentage of 68.3% complain from shoulder pain, 6 physiotherapists with percentage of 2.7% complain from elbow pain, and 65 physiotherapists with percentage of 29.0% complain from wrist pain, table (3) & figure (2).

The physiotherapists suffering from lower limb were 87 with percentage of 21.8 %. From the 87 physiotherapists, table (2) there were 5 physiotherapists with percentage of

5.7% complain from hip pain, 54 physiotherapists with percentage of 62.1% complain from knee pain, and 28 physiotherapists with percentage of 32.2% complain from ankle pain, table (3) & figure (2).

The physiotherapists suffering from back disorders were 247 with percentage of 61.75%. From the 247 physiotherapists, table (2) there were 103 physiotherapists with percentage of 41.7% complain from cervical pain, 36 physiotherapists with percentage of 14.6% complain from upper back pain, and 108 physiotherapists with percentage of 43.7% complain from low back pain, table (3) and figure (2).

Table (3): Characteristics of Work Related Musculoskeletal Disorders.

Upper limb diagnosis	No	%
Shoulder pain	153	68.3%
Elbow pain	6	2.7%
Wrist pain	65	29.0%

Lower limb diagnosis		
Hip pain	5	5.7%
Knee pain	54	62.1%
Ankle pain	28	32.2%
Back diagnosis		
Cervical	103	41.7%
Upper back	36	14.6%
Lower back	108	43.7%

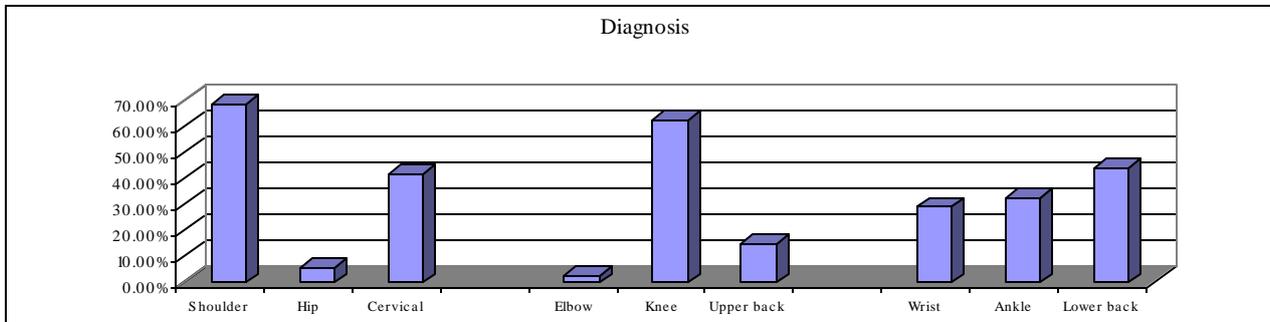


Fig. (2): Characteristics of Work Related Musculoskeletal Disorders.

Relationship of Work Related Musculoskeletal Disorder and number of patients treated per day among Egyptian Physiotherapists

Regarding Upper limb work related musculoskeletal disorder, There was significant relationship between prevalence of upper limb work related musculoskeletal disorder and number of patients (P = .018).

Concerning lower limb work related musculoskeletal disorder, there was significant relationship between the prevalence of work-related lower limb disorder and the number of patients treated per day (P = .023). Regarding back work related musculoskeletal disorder, there was significant relationship between the prevalence of back disorders and number of treated patient per day (P = .02), table (4).

Table (4): Relationship of work related musculoskeletal disorder and number of patients treated per day among Egyptian physiotherapists.

Number of patients	Upper limb			Sig.	Lower limb			Sig.	Back			Sig.
	No.	%	P		No.	%	P		No.	%	P	
0-20	168	55.4%	0.018	S	64	25.4%	0.023	S	188	61%	0.02	S
21-30	39	66.1%			15	21.1%			36	62%		
31-40	14	41.2%			6	17.6%			21	61.8%		
41-50	3	75%			2	50%			2	50%		

S: significant

Prevalence and relationship between Work Related Musculoskeletal Disorders and Physical Risk Factors among Egyptian Physiotherapists

Upper limb work related musculoskeletal disorders was significantly related with lifting load above 5Kg (P=0.0001), regularly applying force with hand (P=0.03), and work with hand above shoulder level (P=0.03), table (5).

Lower limb work related musculoskeletal disorders was significantly related with standing long periods (P=0.04) and work in squat/kneeling positions (P=0.04), table (5).

Back work related musculoskeletal disorders was significantly related with standing long period (P=0.04), pushing or pulling load over 5Kg (P=0.04), regularly applying force with hand (P=0.04), performing same tasks over and over (repeat the same

movement) (P=0.04), bend or twist upper body (P=0.04), table (5).

Table (5): Prevalence and relationship between Work Related Musculoskeletal Disorders and Physical Risk Factors among Egyptian Physiotherapists.

Physical Risk Factors	Upper limb		Lower limb		Back	
	P-value	Sig.	P-value	Sig.	P-value	Sig.
Standing long period	0.27	NS	0.04	S	0.04	S
Sitting long period	0.15	NS	0.29	NS	0.06	NS
Walking long period	0.66	NS	0.30	NS	0.08	NS
Work squat/ kneeling	0.73	NS	0.04	S	0.63	NS
Work hand above shoulder level	0.03	S	0.14	NS	0.07	NS
Work hand below knee level	0.81	NS	0.07	NS	0.39	NS
Lifting load below 5kg	0.53	NS	0.56	NS	0.85	NS
Lifting load above 5 kg	0.0001	S	0.25	NS	0.85	NS
Pushing or pulling load over 5 kg	0.08	NS	0.2	NS	0.04	S
Regularly apply force with hand	0.03	S	0.96	NS	0.04	S
Bend or twist upper body	0.47	NS	0.43	NS	0.04	S
Working prolonged periods in a same posture	0.14	NS	0.48	NS	0.33	NS
Repeat same movement	0.92	NS	0.2	NS	0.04	S

S: significant, NS: significant

DISCUSSION

The purpose of this study were to steady the prevalence of work related musculoskeletal disorders and to investigate the relationship between physical risk factors and musculoskeletal disorders among Egyptian physiotherapists in the previous 12 months.

This study found that about 90.75% of the participating physiotherapists complained of work related musculoskeletal disorders. This was close to the prevalence reported in Nigeria 91.3%². However, it is higher if compared with the reported prevalence of work related musculoskeletal disorders among physiotherapists in Zimbabwe 78%²⁶, in the United States 61%⁴, in United kingdom 68%¹¹ and in Kuwait 47.6%¹³. The higher 12-months prevalence found in our study suggests that physiotherapists' practice in Egypt highly predisposes to work related musculoskeletal disorders. This may be a reflection of the conditions under which physiotherapists practice in Egypt. Physiotherapy practices in Egypt, like in many other countries is largely bedeviled by unwholesome work settings, lack of appropriate equipment including those as basic as standard plinths, external weights,

mats, chairs and commodes and increased patient-to-therapist ratios, the average number 8-12 patients/day for physiotherapists, limited therapist-patient contact time and therapists working in all specialties, working with more than one patient at a time. This is beside the influence of peculiar cultural values of physiotherapists such as skills, attitudes of work, the high clinical work-load challenges, and the physiotherapists physically makes them more susceptible to injuries⁵.

We found that the higher prevalence of disorders was back disorders (61.75%), followed by upper limb disorders (56%) and then lower limb disorders (21.75%). These findings correlate work related musculoskeletal disorders to the particular therapeutic tasks performed daily by physiotherapists (e.g., lifting, transferring, manual therapy)^{4,7,14}. These tasks can put stresses on specific anatomical areas (e.g. Shoulder, lower back, neck, upper back, and hand/wrist).

The lower back was the most commonly affected part of back with a percentage of 43.7% in this study. This was near to the reported prevalence among physiotherapists in the United States (45%)⁴, and higher than the

United Kingdom (37.2%)¹¹ and less than Nigeria (69.8%)², and Australia (62.5%)²⁴. These results that implicated that lower back one of the most commonly affected anatomical area among physiotherapists^{1,13,23}. The low back disorders may be due to small work place, providing manual resistance, assisting patient in many condition as during gait, un-adjustable bed/mats and chairs and repetitive bending, twisting and lifting. These entire factors make cumulative loads to the spine through the day, week, and years. Although peak force may be mild, repetitive, cumulative load increase risk of damaging low back tissue thus resulting in disorders.

The shoulder was the most affected part of upper limb with a percentage of 68.3% in this study. This was higher prevalence rate reported in comparison with the previous study as in Nigeria it was (22.2%)², United Kingdom was (14.8%)¹¹, in Australia was (10%)⁶, in Turkey was (13%)²⁴, and in Kuwait was (14%)¹³. The causes of shoulder disorders may be due to performing repetitive movement, lift too much weight or lift improperly, applying manual resistance, transfers patients. All these causes make repetitive stress and strain on the shoulder joint.

There was significant relationship between number of patients and work related musculoskeletal disorders. This results agree with the results of many studies done by Salisk and Ozcan in Turkey²⁴, Bork et al., in the United States⁴, Glover et al., in United Kingdom¹¹, Adegoke et al., in Nigeria², west and Gardener in Australia²⁷, which reported that the numbers of patients treated per day was a work factor that contribute to work related musculoskeletal disorders.

Regarding the relationship between work related musculoskeletal disorders and physical risk factors, the results of this study revealed that upper limb work related musculoskeletal disorders affected by lifting load above 5 Kg, regularly applying force with hand, and work hand above shoulder level. Lower limb work related musculoskeletal disorders affected by standing for long periods, and work in squat/kneeling position. Back work related musculoskeletal disorders affected by standing for long period, pushing or pulling load over 5 Kg, regularly applying force, performing same

tasks over and over, and bend or twist upper body.

The results of our study were in concurrent with Adegoke et al. (2008), who found that performing the same task over and over and lifting and transferring dependent patients have been reported to be related to the occurrence of low back symptoms². Also, West and Gardner (2001) found that repeated movements and increased work load have been reported to be related to the occurrence of work related musculoskeletal disorders²⁷. Furthermore, Salik and ozcan reported that lifting load over 5 Kg, performing same task over and over have been reported to be related to the occurrence of work related musculoskeletal disorders²⁴.

The result of our study which indicate high prevalence of work related musculoskeletal disorders are due to the daily treatment tasks being performed by physiotherapist who may contribute to stress in these anatomical areas, such as treating a large number of patients per day, lifting or transferring of dependent patients, working in the same position for a long period, doing the same task over and over.

There are some limitations to this study. The main one is the way by which our sample was selected (convenience sampling) which may affect the generalization of the findings in addition to, the difference in physical ability between males and females. Furthermore, the study also relied on self-reported data, and physiotherapists may not have recalled all incidents of work related musculoskeletal disorders.

Clinical Implementations

The findings of the current study provides weight into the prediction of work related musculoskeletal disorders among Egyptian physiotherapists and paves the way to the prevention and intervention strategies work related musculoskeletal disorders.

Conclusion

We conclude that, the prevalence of work related musculoskeletal disorders among Egyptian physiotherapists is high, with the back disorders followed by upper limb disorders then the lower limb disorders.

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