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RESEARCH ARTICLE

STATUS OF WORK RELATED MUSCULOSKELETAL DISORDERS (WRMDS) IN PALESTINIAN PRACTICING PHYSIOTHERAPISTS

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ABSTRACT

Background: Physiotherapists are exposed to many risk factors and occupational injuries in their work environment. The practice of physiotherapy requires the performance of many intensive tasks related to patient care. Such activities include lifting, bending, twisting, performing manual therapy, and maintaining awkward positions for a prolonged period of time. Therefore, physiotherapists are susceptible to musculoskeletal disorders.

Purpose: the objectives of this study are: (1) determining the presence of possible effects on Palestinian practitioner's health, who are working in the physiotherapy profession. (2) Estimating the severity of work related musculoskeletal disorders (WRMDS) among physiotherapists.

Methods: A quantitative –non- experimental survey design was utilized. Based on a literature review and pilot study, five pages self-administered questionnaire was constructed and distributed to 60 physiotherapists with job experience more than 4 years. The questionnaire consists of three parts: demographic data part, and musculoskeletal part. The data which obtained was analyzed using statistical SPSS last version.

Participants: The questionnaire was returned by 60 physiotherapists who were selected using a convenience sample from different clinics and hospitals in East Jerusalem and West Bank, giving a response rate of 66.6 %.

Results: The prevalence of WRMDS was high among Palestinian physiotherapists by (70%); female physiotherapists reported a higher prevalence of WRMDS than male. The neck was the most affected body part by (51.7%). Respondents reported that their most WRMDS occurred whilst working in rehabilitation field (78.6%).

Conclusion: WRMDS, were common and prevalent among Palestinian physiotherapists, so different kind of health strategies should be used to tackle and reduce the prevalence of WRMDS.

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INTRODUCTION

When it comes to musculoskeletal disorders, they can be defined as those disorders which can affect the body's muscles, joints, tendons, and ligaments. Physiotherapists are often at risk for developing work related musculoskeletal disorder (WRMDS) for they are often involved in physically demanding and intense, repetitive tasks in their practices. Physiotherapists are exposed to many risk factors and occupational injuries in their work environment. The practice of physiotherapy requires the performance of many intensive tasks related to patient care. Such activities include lifting, bending, twisting, performing manual therapy, and maintaining awkward positions for a prolonged period of time. Therefore, physiotherapists are susceptible to musculoskeletal disorders (Kenyon, 2004). No doubt that findings indicate some noted substantial effects of WRMDS at work and in the career plans of physiotherapists. To be more specific it was found that work-related musculoskeletal disorders are prevalent in

pediatric physical therapists more than others (Abdelazeim and Radwan, 2015). In some developed nations, research results showed a high prevalence of WRMDS among physiotherapists, where such negatively affected both quality of life and workplace of those therapists (Hyeon and Kyoung, 2016). In some other works, outcome measures were varied, with prevalence rates of WRMDS reported from 28% to 96% over a one-year time period. The lower back was the most commonly affected body part. Relevant factors identified with the development of WMSD included: inexperience in the role and area of employment (Anderson and Oakman, 2016). Further, workplace musculoskeletal injuries were quite common but under-reported. And when it comes to the body parts most affected, they were the lower back, the upper back, the shoulders, and the neck. And finally, there was a kind of strong correlation between the workplace setting and the number of MSDs (Anyfantis and Biska, 2017). The present study comes with the aim to explore the status of WRMDS in Palestinian practicing physiotherapist and to find whether there are statistical differences that can be attributed to their demographics. Lack of research works in such area of study, in

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particular within the Palestinian context, make the present study of great importance, for it is the first of its kind up to the knowledge of researchers.

MATERIALS AND METHODS

Research design: Quantitative, non-experimental survey design was utilized, in particular, descriptive analytical research design.

Research setting and sampling: Sixty male and female Palestinian practicing physiotherapists were selected using a convenience sampling methods, from different cities and towns in Palestine, which include: Jerusalem, Bethlehem, Hebron, Ramallah, Nablus, and Jenin. Our participants are working in public and private practice in various specialties (which are rehabilitation, pediatric, outpatient, as well private clinics).

Data collection tools: A valid questionnaire was decided for data collection. It was mostly designed to be completed by participants themselves. The ideas and thoughts of questions in the questionnaire were inspired based on experience as rehabilitation therapists as well on previous related studies. At the end, we have constructed five pages of a self-administered questionnaire that consisted of two parts: demographic data part, and the musculoskeletal related part. The first part contains of 11 items that represent some determined demographic information including gender, age, and level of education, clinical experience and employment setting, field of work, days of work weekly, height and weight of the participant. The second part contains of 12 items that address work related musculoskeletal issues that asked respondents to highlight many issues related to incidence of work-related musculoskeletal disorders, where participants in this part were asked to fill most of the questions by: yes or no. The questionnaire competency (validity and reliability) was tested in a pilot trial on some physiotherapist (~12 subjects), then content was adjusted via consulting some practicing qualified physiotherapists, physiotherapy and psychology instructors and researchers working within the Palestinian context.

Statistical analysis: The data obtained were analyzed using the Statistical Package for Social Science (SPSS) - last version. Descriptive as well as inferential statistics were employed as necessary tools to reach our outcomes. Frequencies, means and standard deviations were calculated for the targeted variables in relation to WRMDs. And all utilized statistical tests were evaluated at ($\alpha = 0.05$) level of significance.

Ethical considerations: The questionnaire contains informed sheet and the title of our research and its purposes was detailed and specified. Participants were assured the right to refuse filling down the questionnaire and to withdraw from our study in any time without any restrictions. Ethical standards also considered that researchers shouldn't put participants in a situation where they might be at risk of harm as a result of their participation. Also we protected the privacy of research participants especially if they talk about topics related to their organization and its negative impact on their physical or psychological well-being. We have assured that information should not be made available to anyone who is not directly involved in the study. And data is very important and taken as

seriously as highly confidential, and merely used for scientific purposes.

RESULTS AND DISCUSSION

Demographic characteristics of study participants: Out of a total of 90 questionnaires distributed, 60 questionnaires were returned giving a response rate by (66.6%). Among the respondents who participated in the study, 48.3% ($n = 29$) were males, and the remaining 51.7% ($n = 31$) were females. The mean age of the participants was 38.1 years old that ranged from 25 to 55 years. Furthermore, (15%) of the sample were from Jerusalem, (15%) were from Ramallah, (31%) were from Bethlehem, (30%) were from Hebron, (1.7%) were from Jenin and (6.7%) were from Nablus. Participants were represented in five different field of work categories, which was rehabilitation centers (28.3%), pediatric (23.3%), private clinics (13.3%), outpatient (53.3%), and hospitals (15%) as shown in figure (1). Also (31.7%) of the sample had 4-7 years of work experience, (13.3%) had 8-12 years, (13.3%) had 13-17 years, (15%) had 18-22 years, (15%) had 23-27 years, and (11%) had more than 27 years of work experience. Forty five percent (45%) of the sample were within normal weight (18.5-24.9) which is the largest percentage of BMI among participants and (40%) of the sample were overweight and (15%) were obese. Also (21.7%) of participants have another job, (11.7%) of the participants had previous injury not related to their current, but the physical health status of remaining participants was good, in addition, fifty percent (50%) of the participants found to practice sport. Moreover, (46.7%) of participants visited a physician, this factor led to (28.3%) of participants to take sick leave in related to their work related musculoskeletal disorders. Sixty five percent (65%) of the participants have B.A/ B.Sc., degree and the remaining ranged between diploma and master degree.

Body parts: The neck was the site of the highest percentage (51.7%) of work-related injuries, followed by the lower back (40%), then the shoulder (15%) and the hand-wrist (15%), knee (11.7%). The hip -thigh (6.7%), upper thoracic (5%), the elbow (1.7%), and the ankle foot (3.3%) were rarely affected by injuries. See Figure (2)

Activities and tasks: Performing manual therapy techniques was the most activity that physiotherapists do at their work (80%), followed by lifting (63.3%), then bending and twisting (60%), then transferring a patient (58.3%), then applying physical agent modalities (53.3%), then maintaining position for prolonged period of time (48.3%), then working in awkward or cramped Position (23.3%). See Figure (3).

The Status of WRMDs in relation to study demographics: In general, results indicate that prevalence of WRMDs is 70% ($n = 42$) among working Palestinian physiotherapists and the occurrence of WRMDs according to age, gender, field of work, and years of experience are as the following:

Age: The highest prevalence of WRMDs was for respondents whose ages 43-48 years old ($n=7$, 87.5%) followed by 31-36 years old ($n=8$, 80%), 49-55 years olds ($n=9$, 75%), 25-30 years old ($n=12$, 66.7%), and 37-42 years old ($n=6$, 50%). Thus, we may say that the highest prevalence of WRMDs was among physiotherapists whose age over 38 years old.

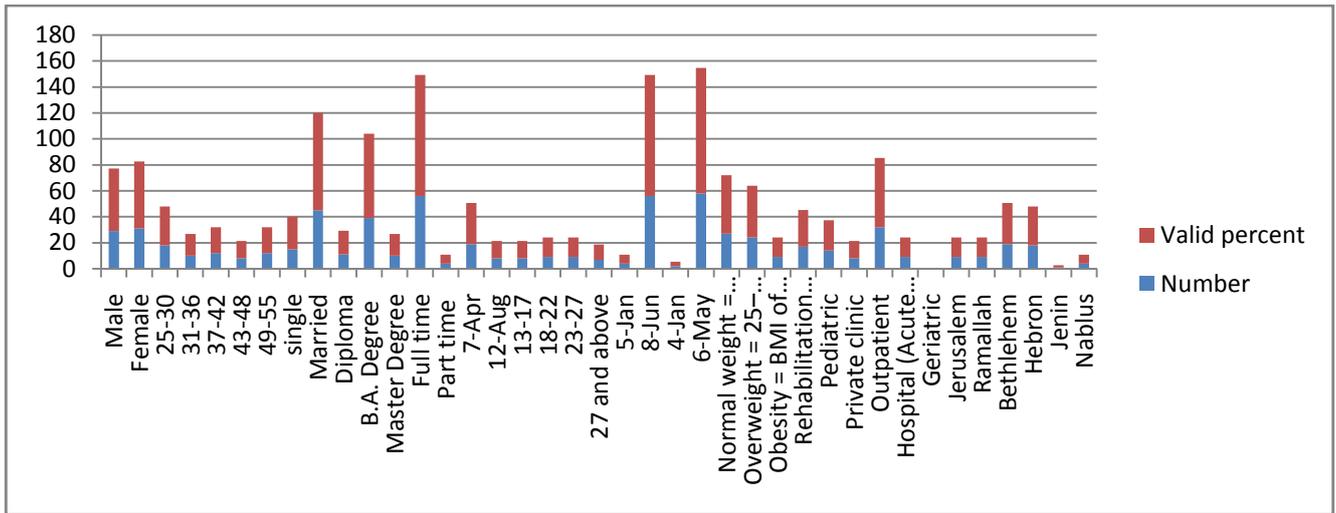


Figure 1. Study demographics of the present sample

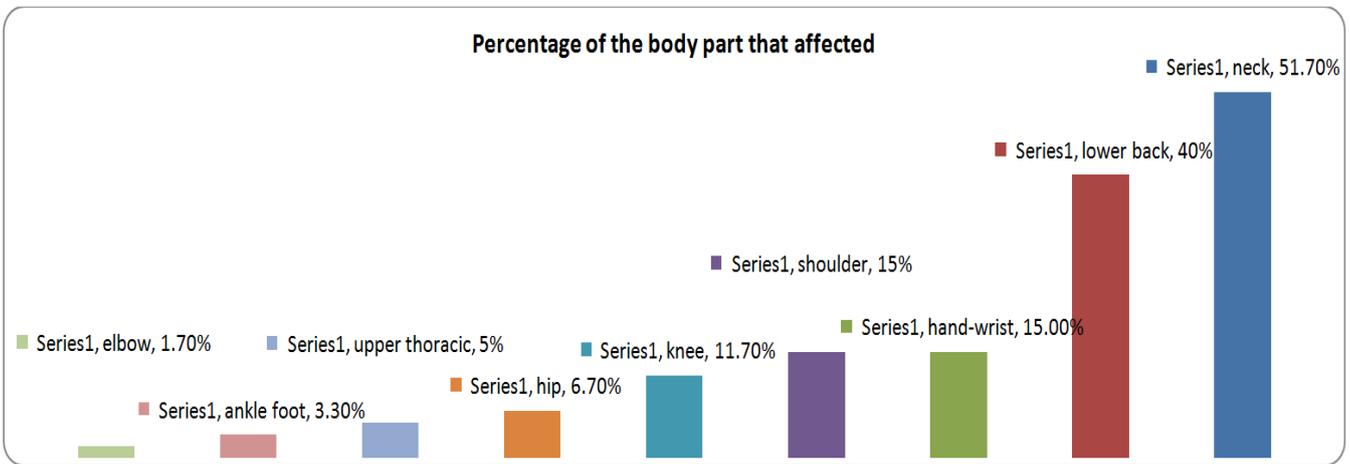


Figure 2. The percentage of body parts that were affected by WRMSDs

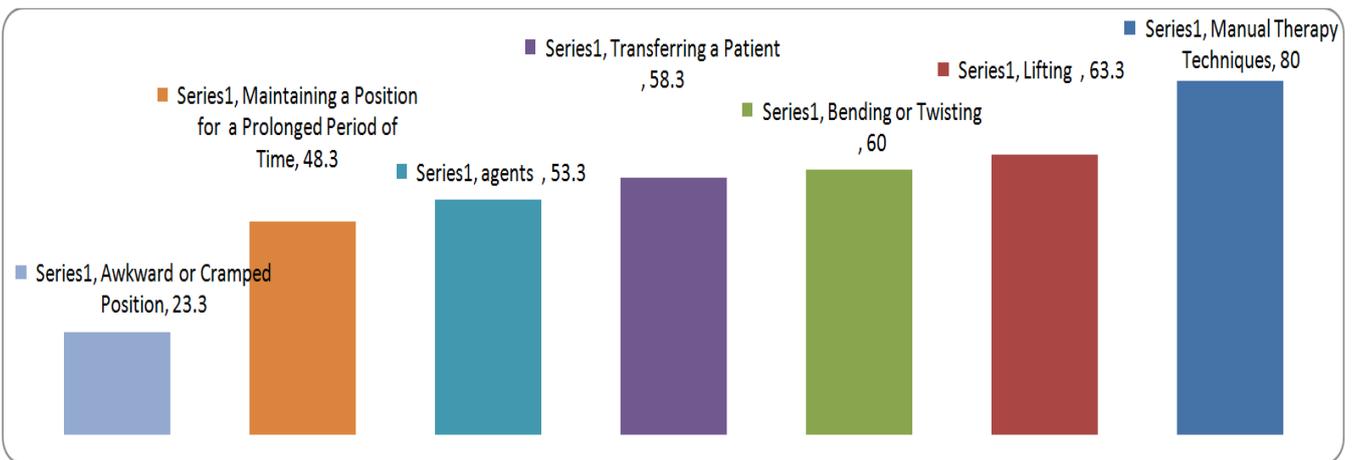


Figure 3. The percentages of activities that physiotherapists do at their work

As table (1) shows, one way analysis of variance test (ANOVA one) indicates that there was no significant difference at $\alpha=0.05$ for the level of the prevalence and severity of WRMSDs in relation to age variable.

Gender: Female physiotherapists reported a higher prevalence of WRMSDs (74.2%) versus males (65.5%). Female physiotherapists reported a higher prevalence of neck

problems (61.3% versus the males 41.4%), shoulder (22.6% versus 6.9%) and hip (9.7 % versus 3.4) WRMSDs than their male colleagues. In contrast, males suffered high prevalence of lower back than females (44.8% versus 35.5%), and then elbow/forearm (1.7% versus 0%) problems. T-test showed that there was no significant difference at $\alpha=0.05$ for the level of the prevalence and severity of WRMSDs in relation to gender as shown in Table (2).

Table 1. Age variable in relation to WRMDs in the studied sample

Age	DF	Sum of squares	Mean Squares	F	Sig
Between groups	4	0.074	0.018	0.912	0.464
Within groups	55	1.114	0.020		
Total	59	1.188	0.038		

Table 2. Gender variable in relation to WRMDs in the studied sample

Gender	Number	Mean	Std. Deviation	DF	T	Sig
Male	29	1.79	0.14	58	0.665	0.509
Female	31	1.77	0.13			

Clinical specialty area (field of work): Respondents reported that their most WRMDs occurred whilst working in neurological rehabilitation (78.6%), then outpatient clinics (65.6%). The relationship between type of complaint (e.g. neck, lower back problems) and clinical setting was evaluated; a higher proportion of neck problems occurred among respondents in rehabilitation field (64.3%), then lower back (50%). Also, the neck was the higher proportion of WRMDs in outpatient (46.9%), then wrist-hand (18.8%). T-test showed that there was no significant differences at $\alpha=0.05$ for the level of the prevalence and severity of WRMDs in relation to the field of work (including pediatric, rehabilitation centers, outpatient, and hospitals). See Table (3).

Table 3. Area of field work in relation to WRMDs in the studied sample

Pediatric	Number	Mean	Std. Deviation	DF	T	Sig
Yes	17	1.77	0.15	58	-0.323	0.748
No	43	1.78	0.14			

Rehabilitation center (Adults)	Number	Mean	Std. Deviation	DF	T	Sig
Yes	14	1.74	0.13	58	-	0.218
No	46	1.79	0.14		1.244	

Outpatient	Number	Mean	Std. Deviation	DF	T	Sig
Yes	32	1.77	0.14	58	-0.251	0.803
No	28	1.78	0.13			

Hospital (Acute Care)	Number	Mean	Std. Deviation	DF	T	Sig
Yes	9	1.77	0.13	58	-	0.828
No	51	1.78	0.14		0.219	

In contrast, T-test showed that there was significant difference at $\alpha=0.05$ for the level of the prevalence and severity of WRMDs in relation to work at private clinics. The difference was for the benefit of workers in private clinics with mean of (1.88), versus non-working in private clinics with mean of (1.76) as shown in Table (4).

Table 4. Private work variable in relation to WRMDs in the studied sample

Private clinic	Number	Mean	Std. Deviation	DF	T	Sig
Yes	8	1.88	0.18	58	2.287	0.026
No	52	1.76	0.14			

Years of work: The relationship between years of experience and work related musculoskeletal disorder. One way analysis of variance test (ANOVA) showed that there was no significant difference at $\alpha=0.05$ for the level of the prevalence

and severity of work related musculoskeletal disorders in relation to the Years of work as shown in Table (5).

Table 5. Years of experience in relation to WRMDs in the studied sample

Years of work	DF	Sum of squares	Mean Squares	F	Sig
Between groups	5	0.049	0.010	0.469	0.798
Within groups	54	1.138	0.021		
Total	59	1.188	0.031		

Being the purpose of the present research work to determine the presence of possible physical effects on Palestinian physiotherapists, who are working in the physiotherapy profession, and to estimate the severity of work related musculoskeletal disorders among physiotherapists whose ages range from 25-55 years with minimum four years of experience, who are working in hospitals, outpatient, rehabilitation, pediatrics, and private clinic fields, our study found that the prevalence of WRMDs among Palestinian physiotherapists was (70%), which is to some extent similar to Nordein et al, (2011) study, which found that the prevalence of WRMDs among Malaysian physiotherapists during the past 12 months of their research work was (71.6%). To be more specific, the higher prevalence of work related musculoskeletal disorders were found in rehabilitation field (78.6%), this result is related to limited places of rehabilitation centers in Palestine and number of physiotherapists in this field, so therapists were working with more than one patient at a time that lead to high clinical work-load challenges. Furthermore, physiotherapists who working in rehabilitation field treat patients who are likely to be less independent than patients treated in ambulatory settings, which most of them have neurological disorders such as stroke, spinal cord injury that demand many hard activities that can affect negatively on the body such as lifting, transferring patients etc.

In contrast, Nordein *et al.*, (2011) study reported that most of WRMD's was more common among therapists who were working in pediatric field. However, there are two previous studies reported that the most effected therapists are those who are working in outpatient settings (Glover *et al.*, 2005; Amy *et al.*, 2012). When it comes to affected body parts, the neck was the site of the highest percentage (51.7%) of work-related injuries, followed by the lower back (40%), and the reasons of that high percentage are that (53%) of our study working in outpatient field, and the most activities that our participants do are performing manual therapy techniques (80%) then lifting (63.3%), so therapists performing high repetitive tasks, which lead to neck and back problems. Moreover neck and back muscles anatomy and kinesiology contract and stay contracted to hold the position stable for as long as the task requires so force are concentrated in neck and back region. Moreover, (21.7%) of participants have another job that increase the incidence of WRMDs. Similar to Cromie *et al.*, (2000) study which reported that neck and upper limb was the highest prevalence of musculoskeletal disorders. The findings of this study support those of previous studies which reported that low back pain was the highest prevalence of musculoskeletal disorders among physiotherapists (Alrowayah *et al.*, 2010; Glover *et al.*, 2005; Holder *et al.*, 1999; Rugel, 2003). The high prevalence of work related musculoskeletal disorders were for respondents whose aged more than 38.5 years, physiotherapy profession is physically demanding so after many years body becomes more susceptible to musculoskeletal

disorder as a result of wear and tear process that affect body structures. In contrast to Glover et.al (2005) and Alrowayeh *et al.*, (2010) studies which reported that most of the participants who are younger (under 30 years) had musculoskeletal disorder that could be associated with a lack of professional experience, knowledge and skills, while few of those participants which were older than 40 years complained from musculoskeletal disorder. The prevalence of work-related musculoskeletal disorders was higher among female physiotherapists (74.2%) versus males (65.5 %). This finding goes in agreement with findings from several studies such as Glover *et al.*, (2005) and Alrowayeh *et al.*, (2010) which reported that female therapists recorded a higher prevalence of work related musculoskeletal disorders than the male therapists. In general, females are physically weaker than males, and this may place them at a disadvantage during patient care tasks, particularly when lifting and transferring patients. Females are also exposed to pregnancy-related stress, which commonly affects the lower back region. Even though the current study did not include any pregnant therapists, changes in spinal posture and a weakening of joint structure related to a history of pregnancy which increases the risk of WRMDs. These reasons may explain why the female therapists reported a higher incidence of WRMDs than their male. Physiotherapists who are overweight within (25- 29.5) reported the highest prevalence of work-related injuries (36%) which is similar to Nordin, (2011) study which reported that physiotherapists with a BMI over 25 reported the highest prevalence of work-related injuries (80%). The therapists who are overweight may not be physically active, also their high weight can stress the joints and they are at greater risk for back pain, joint pain and muscle strain than those who are not obese, such that they may be more susceptible to WRMDs. Participants in our study who are overweight were 24 participants (40%), and obese physiotherapists were 9 participants (15%), so obese participants took small percentage of our result related to BMI. As shown, physiotherapy profession has negative effect on therapist's health; labor-intensive tasks appear to make PTs susceptible to occupational musculoskeletal injuries. A result, physiotherapists should decrease work hours, work load and number of patients that he/she treat per day to decrease work related muscle skeletal disorders.

Conclusion

The current study was able to explore the prevalence and severity of work related musculoskeletal disorders among Palestinian physiotherapists, which showed that (70%) of these therapists complain from work related musculoskeletal disorders as shown in previous studies which reported almost the same results due to work sittings, movements, lifting or carrying, and repetitive tasks that physiotherapists performed at their work. The prevalence of WRMDs is higher among females than males and higher for therapists who are working in the rehabilitation specialty.

The most affected locations were the neck followed by lower back regions.

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