Work-Related Injuries and Safety Concern among Physiotherapists in Libya: An Exploratory Study

(Original Research Article)

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Abstract

The objective of this study was to determine the prevalence of and risk factors for work-related injuries among physiotherapists in Libya. A self-administered questionnaire was sent to 80 physiotherapists in Toubrok city, and neighboring area. Unconditional logistic regression was used to study the association between job exposures and the risk for work-related injuries. The questionnaire was returned by 58 physiotherapists. Of 58 subjects who answered specific questions about work-related injuries, 52 (53.5%) were affected by work-related injuries in at least one body part. Regions most affected were the lower back, the neck, elbows, and knees. For neck pain, associations were found with: manual therapy techniques (adjusted odds ratio [OR]53.90;95% confidence interval [CI]51.2–13.1); working in awkward or cramped positions (OR54.96; 95% CI51.3–18.7); and high psychological job demands (OR54.34; 95% CI51.2–15.0). For lower back pain, associations were found with working in awkward or cramped positions (adjusted OR56.37; 95% CI51.6–24.7); and kneeling or squatting (adjusted OR54.76; 95% CI51.4–15.9). The majority of the respondents reported work-related injuries. General physical and psychosocial work-related exposures, as well as specific therapy tasks, were strongly associated with work-related injuries. The increased prevalence of symptoms among younger physical therapists in particular underlines the need for them to have at their disposal a range of strategies to reduce risks posed by their work and avoid injury. Most importantly, there is a need for further research to identify aspects of physical therapy practice that place therapists at greatest risk and to develop methods of reducing that risk.

Keywords: Work-Related Injuries, Safety, Physiotherapists, Libya.

Introduction

Work-related injuries is a collective and descriptive term refers to the symptoms caused or aggravated by work and characterized by discomfort, impairment, disability or persistent pain (Sharan, Rajkumar, & Balakrishnan, 2018). Work-related injuries include a wide array of complains that affect muscles, ligaments, joints, and soft tissues, such as shoulder and elbow pain, neck pain, and low back pain, and other body organs and systems. Work-related injuries are among the most common work-related problems that face physiotherapists worldwide. In Europe for instance, estimations suggest that millions of physiotherapists complain of work-related injuries caused by work activities (Anyfantis & Biska, 2018). This number is much higher in the United States of America, and the Eastern Asian countries where the population is high (Vieira et al., 2016). In the middle east, there is not much published data describing these problems but there are indicators that physiotherapists in Egypt, Kuwait and the Kingdom of Saudi Arabia have similar complains as their counterparts elsewhere (Al-Eisa, Buragadda, Shaheen, Ibrahim, & Melam, 2012).

Risk factors can be generally classified into extrinsic and intrinsic factors. Physiotherapists routinely perform manual therapy, such as soft-tissue mobilization, which means that the upper limb is also exposed to risk factors associated with musculoskeletal and neurovascular disorders (Adegoke, Akodu, & Oyeyemi, 2008). In addition, these professionals routinely perform activities that involve transferring a patient (from exercise mat to chair, to parallel bar etc), assisting with activities on the exercise mat, and lifting and using cumbersome equipment (Nyland & Grimmer, 2003). These work tasks put therapists at risk for both acute and cumulative musculoskeletal pain. Extrinsic factors include the physical demands of physiotherapists to perform treatment tasks or to interact with their patients before, during, or after the treatment sessions. Usually physical demands of the physiotherapists during the sessions, include bending, twisting, and carrying heavy objects (patients or equipment). Physical demands of physiotherapist-patient interaction include; turning, positioning, dressing, seating the patient in the bed and/or chair and transferring the patient. There were different tasks: stretcher to bed, bed to chair, bed to treatment room …etc. (Falavigna et al., 2011).

The primary intrinsic risk factor is obesity of physiotherapists. A recent study was done by Al-Eisa et al. (2012) in Egypt and Saudi Arabia found that nearly 80% of surveyed physiotherapists were obese (Al-Eisa et al., 2012). This high obesity prevalence, however, is alarming because it is much higher than the published rates in western societies such as UK 39% (Glover, 2003), Sweden 26% (Grooten, Wernstedt, & Campo, 2011), and USA 58% (Campo et al., 2008b). The high prevalence of obesity among Arab physiotherapists may be related to a sociocultural factor. Obesity among physiotherapists is closely related to the development of lower back injury due to their genoid somatotype of obesity (Østbye, Dement, & Krause, 2007).

Gynoid somatotype is commonly described as a pear shaped, where the increased accumulation of body fat is found around the waist and hips. Literature reports that

physiotherapists' average body mass index is 31.7 kg/m² that exceed the American College of Sports Medicine Guidelines (ACSMG) (Naidoo & Coopoo, 2007). Naidoo and Coopoo and others correlated the genoid somatotype of obese healthcare professionals to the prevalence of lower back injuries which is supported by many studies (Choobineh, Rajaeefard, & Neghab, 2006; Souliman, Sana I., et al., 2020). The excess body fat around the waist and hip causes anterior pelvic tilt which produces an abnormal force couple relationship between the hip extensors and flexors. Hip flexors became tight while the hip extensors are elongated and weaker (Mansfield & Neumann, 2013).

The Neck was the body part with a high frequency of work-related injuries in many studies. Salik and Ozcan (2004) reported that 26% of their study claimed neck pain or injury in the workplace (Souliman[1], Sanal, et al., 2019). According to Glover et al (2005), 25% of surveyed physiotherapists in the UK reported wrist and hand problems related to work (Glover et al., 2005). Campo et al. (2008) found a strong association between risk factors and work-related injuries of the wrist and hand due to manual physiotherapy techniques. Of the many techniques applied in physiotherapy practice, the most substantial effect was seen with higher levels of soft tissue work, such as massage and joint manipulations (Campo et al., 2008b).

Physiotherapists are exposed daily to electromagnetic radiation by operating shortwave and microwave diathermy units. Recent studies suggest that use of shortwave diathermy is associated with an excess risk of birth defects, prenatal deaths, and late spontaneous abortions among the offspring of exposed female therapists (Ouellet-Hellstrom & Stewart, 1993). Physiotherapists are exposed susceptibleto infection with certain types of microbes as skin infection amd other.

Materials and Methods

Data were gathered using 4-page, self-report, questionnaires. questionnaires are a commonly used tool in healthcare epidemiology research. Data was collected between January and March 2019.

The researchers randomly selected 88 physiotherapists working in hospitals and clinics in the eastern territory of Libya, mainly in the city of Tobruk. However, to meet the pre-determined sample size requirement. Also collected data in Derna, Al-Baida, Al-Marge, and Benghazi cities. 88 of physiotheraspist was selected, 80 of them were determined to be eligible. Seven of them were still trainees or students have been excluded from the study. One physiotherapist was a visitor; therefore, he was excluded. Questionnaires were sent to the 80 physiotherapists who were potentially eligible. Two weeks later, a total of 58 questionnaires were returned to the principal investigators.

The project included licensed physical therapists who were graduated from an accredited university, school or college, and involved in direct patient care at least 1 hour per week at their primary position. The physiotherapists had to return both questionnaires, and they had to reside

in Tobrok as a prerequisite for eligibility. Students, trainees, and visitors were excluded from the study. No other exclusion criteria were applied.

The questionnaire was formally pilot tested in 2 phases. The first phase was a panel discussion with 3 physiotherapists. Panel participants were selected by judgment sampling so that they included both expert and novice clinicians. The mean age of panel participants was 34.1 years, and the mean experience was 8.6 years. The panel included 3 qualified clinical physiotherapists (1 from Libya, 1 from Canada, and 1 from Egypt).

In response to comments by panel participants, the scaling of the highest exposure category was changed from a frequency of 20 to 15. Both during the panel discussion and during informal feedback from physiotherapists, a pain level of 4/10 was determined to be a reasonable level to differentiate minor complaints from more serious work-related pain. The second phase was a test-retest reliability comparison with other similar questionnaire found in the literature. Intraclass correlation coefficients (2-way, mixed model for absolute agreement) for test-retest stability of questions related to specific physiotherapy tasks ranged from .80 to .91.35 Questions related to general physical risk factors demonstrated moderate to good reliability.

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Data Analysis

Data were analyzed using SPSS (version 4.0.1) for Windows (Graduate Pack, version 14.1) and Intercooled Stata (version 9.2 for Windows) computer programs. Exposure and background data and outcome data were taken from the questionnaire. Descriptive statistics were produced for all background factors, exposure factors, and outcomes. The effect of background factors on safety of workers in physiotherapy settings was analyzed using independent-sample t-tests for continuous variables and the chi-square test of association for categorical variables.

Prevalence (for each body region) was calculated by taking the number of cases in that body region and dividing it by the total number of physiotherapists who responded to the questionnaire. Incidence (for each body region) was calculated by taking the number of cases in that body region and dividing it by the number of physiotherapists who did not have a work-related problem in the same body region for at least 8 weeks prior to baseline.

Results and Discussion

Data were collected between January and March 2019. The Qualtrics software used eliminated the need for data entry, because some of the responses were sent electronically to the researchers as entered by the respondents. Descriptive statistics were then calculated. The overall prevalence and severity of work-related symptoms among the respondents were calculated and presented per group, specialty, practice setting and body part affected by injury. We used general linear models to derive age and gender, adjusted proportion of

physiotherapists with work-related injury. The total number of physiotherapists that completed the entire survey was 58 out of 80 questionnaires were distributed. The response rate was satisfactorily high at 78%. Of which, 31 were female, and 27 were male. The mean age was 33.4 + 8.1 years, with a range of 23 - 52 years. The height was 167.4 + 7.9 cm, and BMI: 32 + 2.6 kg/m². The BMI estimation of the respondents showed that 74% of the participants were overweight or obese, 22% were within the normal weight, and about 4% were underweight. In relation to respondent's highest physiotherapy training degree, 70% had undergraduate degrees (Bachelor or diploma), 28% had master's degrees, and 2% had other qualifications including MD, PhD, and other professional degrees. In terms of physical activity and sports, only 12% of the respondents reported doing exercise regularly, and 88% reported minimal or no regular physical activity. The background characteristics of the research subjects are presented in (Table 1).

Table 1 Demographics and Background Characteristics.

VARIABLES	NUMBER	PERCENT
		SEX
Female	31	52.1 %
Male	27	47.9 %
Age In Years (Mean ± SD)		33.4 ± 8.1
Weight In Kg (Mean ± SD)		82 ± 19.5
Height In Cm (Mean ± SD)		167.4 ± 7.9
BMI IN KG/M (MEAN ± SD)		32 ± 2.6
		Physiotherapy Specialty
Musculoskeletal Physiotherapy	18	31.3 %
Pediatrics Physiotherapy	12	20.6 %
Neurological Physiotherapy	19	32.8 %
Sports Injuries And Physiotherapy	7	12.2 %
Geriatrics Physiotherapy	2	3.4 %
Work Experience In Years (Mean ± Sd)		11.6 ± 6.4
Daily Contact Time With Patients In Hours (MEAN ± SD)		8.1 ± 4.7

Work-related injuries experienced by physiotherapists that participated in our study. A Likert scale was used, starting from "no strain" up to "most strain". About 91% of the respondents experienced a work-related injury. A pseudo-variable called suffer score index was calculated by determining the sum of the Likert answers for each body part affected for each respondent. In figure 1 below it can be seen that most complaints and strain refer to the neck, lower back, shoulders, elbows, and knees as shown in (Fig 1).

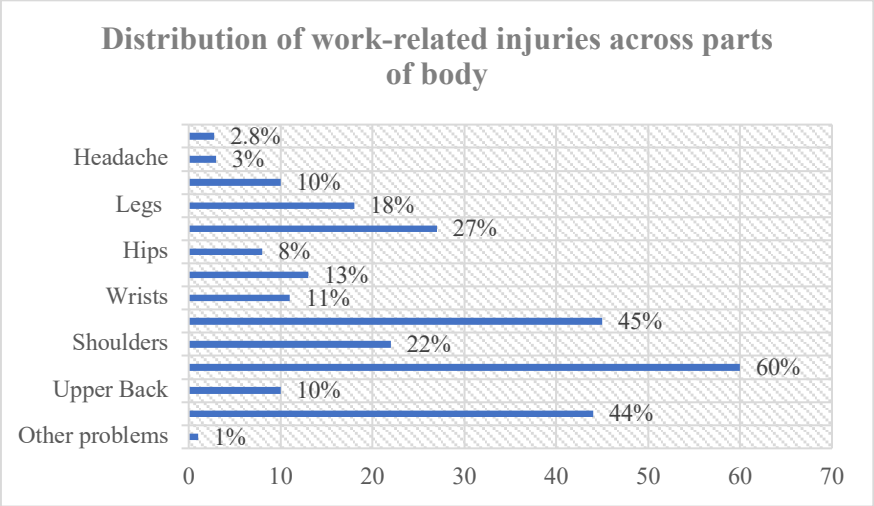

Figure 1 Distribution of Work-Related Injuries across Parts of Body.

linking work-related injuries with particular specialty areas of physical therapy practice. Physiotherapists who had ever worked in public hospital practice, musculoskeletal physiotherapy, or pediatrics had increased odds of reporting work-related injuries in the last 12 months. Physiotherapists currently working in private practice reported less work-related injuries than their counterparts in the public sector. Across all tasks, only three tasks were revealed by chi-square analysis to be related to work-related injuries. Although mobilization and manipulation techniques and other hands-on treatments were associated with increased risk of work-related injuries, the ORs obtained for mobilization and manipulation were generally higher than for other hands-on techniques. Four of the 6 increased ORs for mobilization and manipulation were greater than 2.5, whereas none of those for other hands-on techniques exceeded 2.5. Three of the 6 ORs for other hands-on treatments were less than 2.0. Electrotherapy, cardiothoracic (acute and cardiac rehabilitation), neurological (acute and long-term rehabilitation), hydrotherapy, general and outpatient rehabilitation, and education and training and administration tasks were not significantly associated with the presence of work-related injuries.

Table 2 Linking Work-Related Injuries with Particular Physiotherapy Practice.

WORK ACTIVITY	NUMBER	PERCENT
Manual Therapy Techniques	21	36.2 %
Maintaining A Position For A Long Time	14	24.1 %
Repeated Activities	8	13.8 %
Bending	11	18.9 %
Lifting Heavy Objects	26	13.1
Working In A Bad Position	27	44.8 %
Transferring A Patient	17	29.3 %

Squatting	10	34.4 %
Performing Overhead Activities	7	12 %
Walking	17	29.3 %
Climbing Stairs	34	58.6 %
Reaching	15	25.8 %

Work-related injuries with gender (male vs. female) whears statistical analysis (Spearman's rank-order correlation) revealed that there is a significant difference in suffer score index between men and women. About 78% of female respondents reported having at least one work-related injury. Although men have been identified to work more and experience more working hours in a standing position, females appear to have almost double of work-related injuries than their men colleagues due to the structural difference between them. In additional, statistical analysis showed that there is an apparent correlation of gender and musculoskeletal injuries (LBP, Neck pain, Shoulder pain, and elbow pain) when certain acts such as massage are performed as shown in (Figure 2).

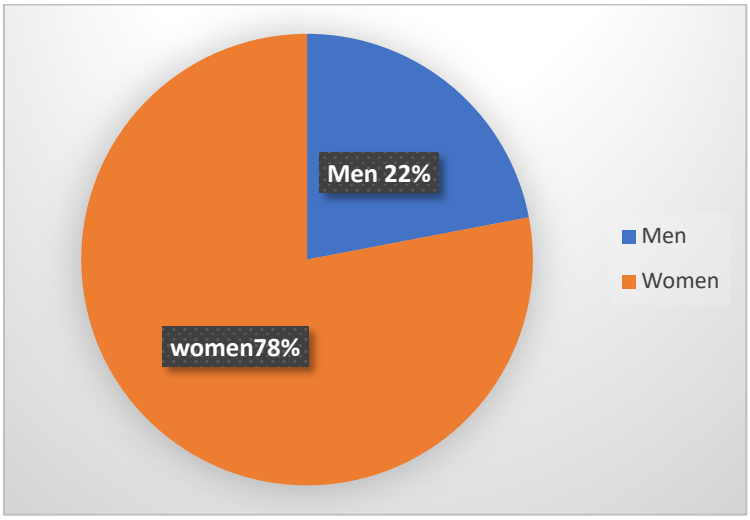

Figure 2. Comparison of Work-Related Injuries between Men and Women.

Work-related injuries and clinical settings whears respondents who reported their most serious injury (n = 58) were asked in which clinical setting they were working when their symptoms first appeared; those participants who responded were undergone further statistical analyses. Clinical setting was significantly related to respondents' most serious injury ($P < 0.001$).

Respondents reported that their most significant injury occurred while working in general or public hospitals(56%), the outpatient clinics (26%), and the inpatients care (10%). The relationship between type of injury (e.g. spinal, upper limb/lower limb problems) and clinical setting was evaluated, and the effect of clinical setting was found to be significant ($P < 0.001$).

A higher proportion of upper limb injuries occurred among respondents in public hospitals and in outpatient clinics. Of all respondents whose major or most significant injury had been to the wrist or hand, first experienced symptoms while working in public hospitals, or in outpatient clinics.

This increased to 60% for respondents whose most significant injury had been to their lower back. Of respondents reporting low back problems as their most serious injury, outpatient clinics was the setting for first onset of symptoms for 18%, followed by inpatients (17%), elderly care (14%) and orthopedics (11%). As shown (Figure 3).

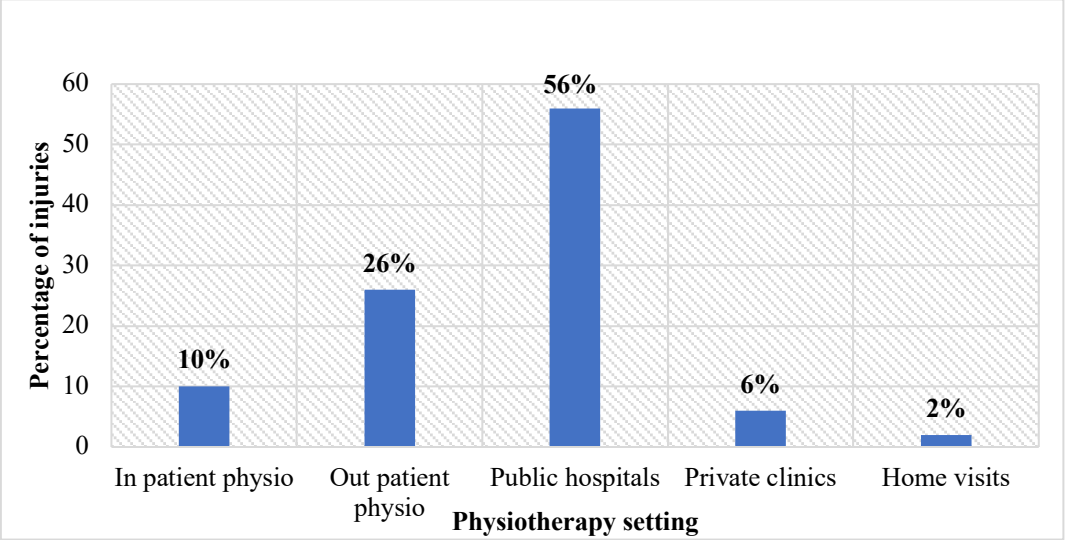

Figure 3 Type of Injury by Clinical Setting.

Holder et al (1999) where's conducted studies at least one-quarter of working professionals are affected by long standing health problems that limit everyday activities while this present studies about 91% of the respondents experienced had a work-related injury. Sharan, Rajkumar, & Balakrishnan, (2018), Al-Eisa, Buragadda, Shaheen, Ibrahim, & Melam, (2012), Campo, Weiser, Koenig, & Nordin, 2008b; Salik & Özcan, (2004) and Vieira et al., (2016) studied work-related injuries include a wide array of complains that affect muscles, ligaments, joints, and soft tissues work-related injuries are among the most common work-related problems that face physiotherapists worldwide that agreement with this study whereas was most common complaint in lower back, shoulder, neck and knee.

Darragh et al. (2009) documented that physiotherapists cite work-related injuries, such as low back pain, upper and lower limbs injuries are the key triggers to premature retirement (Darragh, Huddleston, & King, 2009). In this study about 60% of injuries in lower back.

Cromie et al.,(2000) reported an annual prevalence of low back symptoms of 63%, with 48% of injured therapists reporting the low back to be their most serious work-related problem. Salik and Ozcan (2004) reported that 26% of their study claimed neck pain or injury in the workplace. In this study about 44% had neck injury. According to Glover et al (2005) 25% of surveyed physiotherapists in the UK reported wrist and hand problems related to work (Glover et al., 2005).

In this study about 44% had neck injury. According to Glover et al (2005) 25% of surveyed physiotherapists in the UK reported wrist and hand problems related to work (Glover et al., 2005). In this study about 11% wrist injury and 13% fingers injury. Manual therapy has also been studied as a risk factor for wrist and hand injuries by Wajon et al. and Gyer et al. (Gyer, Michael, & Inklebarger, 2018; Wajon, Ada, & Refshauge, 2007).

According to the literature the work-related activities that most commonly lead to injury in health professionals are lifting heavy equipment and patients, transferring patient, maintaining the same posture for a long period, manual therapy practices, responding to patients' sudden movements, and repeated movements (Anyfantis & Biska, 2018). In this study the Working in a bad Position, manual therapy techniques, transferring a patient, maintaining a position for a long time, and lifeting heavy objects were 44.8 %, 36.2 %,29.3, 24.1 %, and 13.1%, respectively.

Conclusion

The purpose of this study was to establish baseline data on work-related problems experienced by physiotherapists in Libya whereas our questionnaire reveals that the work-related injuries in physiotherapists in Libya are similar to rates reported in other countries.

Physiotherapists in our country suffer similar work-related injuries as their counterparts elsewhere, despite different legal working conditions and cultural differences. This study provides data related to work-related injuries in physiotherapists in Libya. Further studies can be very useful if it researches prevalence of work-related injuries in physiotherapists who have employed different working conditions.

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