

## PREVALENCE OF LUMBOSACRAL RADICULOPATHY AMONG PHYSIOTHERAPISTS OF PEDIATRIC REHABILITATION

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### Abstract

**Introduction:** Physiotherapists (PTs) are at a significant risk of having musculoskeletal problems as a result of their jobs such as Work Related Musculoskeletal Disorders (WRMDs). WRMDs are described as injuries that involve a wide spectrum of inflammatory or degenerative diseases and disorders that result in pain or functional impairment, according to the World Health Organization. The aim of current study was to determine the prevalence of lumbosacral radiculopathy among pediatric physiotherapists in the ministry of health in Cairo, Egypt.

**Material and methods:** two hundred participants included in this study from both sex with age ranged from 25-40 years. participants were assigned to Single group related measurement design. Specific questionnaire based on Roland Morris questionnaire (for back pain) and Modified Roland Morris questionnaire (for leg pain) (RMQ, RMQ-L) respectively.

**Results:** there is a statically significant association between Age, BMI, working years, work hours per day and number of patients/day and lumbosacral radiculopathy; while sex had no significant association with lumbosacral radiculopathy. Subjects with age 30-37 years were 4.01 times more likely to have lumbosacral radiculopathy compared with subjects with age 25-29 years. Subjects working > 4h/day were 4.57 times more likely to have lumbosacral radiculopathy compared with subjects working 2-4 h/day. The results of this study showed that the point prevalence of lumbosacral radiculopathy was 30.5% (p > 0.05).

**Conclusion:** according to this results, lumbosacral radiculopathy is common among Egyptian pediatric

Manuscrito recibido: 10/04/2024

Manuscrito aceptado: 25/04/2024

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physiotherapists, Making Cairo's pediatric physiotherapists at a high-risk group, which necessitate appropriate intervention to manage such problem.

**Keywords:** Prevalence. Lumbosacral radiculopathy. Low back pain. Pediatric physiotherapists. Rehabilitation

### Introduction

Lumbosacral radiculopathy is a very prevalent problem in clinical practice, accounting for a significant percentage of annual medical visits. Because the vast majority of instances are benign and will resolve spontaneously in the absence of clinical red flag signs, conservative therapy is the best initial approach. When symptoms persist, imaging examinations, electromyography, and nerve conduction studies can assist medical professionals in diagnosing the issue [1].

Physiotherapists (PTs) are at a significant risk of having musculoskeletal problems as a result of their jobs such as Work Related Musculoskeletal Disorders (WRMDs). WRMDs are described as injuries that involve a wide spectrum of inflammatory or degenerative diseases and disorders that result in pain or functional impairment, according to the World Health Organization [2].

Work Related Musculoskeletal Disorders are widespread in other anatomical areas such as neck, elbow, wrist and hand, but studies have found a significant prevalence of lumber [3]. This could be brought on by any local degenerative condition affecting the intervertebral foramen or a disc protrusion [4]. There is a range of 0.7% to 9.6% for the incidence and 2.2% to 8% for the prevalence of lumbar radiculopathy [5].

It is well documented that health care workers are at high risk of musculoskeletal disorders [6]. Despite that nurses have reported the highest rates of WRMDs in different work settings, yet Physiotherapists (PTs) are exposed to the same risk factors [7,8]. Repetitive tasks, continuous bending, awkward sustained postures, lifting and transferring patients are considered main risk factors, making healthcare providers vulnerable to musculoskeletal injuries [9-12].

Lower back pain (LBP) is a common occurrence for physiotherapists, particularly those working with children. This is because their jobs need them to do demanding physical tasks such as standing, bending, and lifting patients into ideal functional positions [13].

The human back is heavily stressed during lifting due to a variety of factors,

including rotator torque, vertical compression, and horizontal shear, to name a few. Every structural element of the human trunk, such as the vertebrae, spinal ligaments, and spinal muscles, will participate in and bear the stress during exercise, and these diverse elements will be stressed in different ways throughout different stages of any particular lift. The long axis of the spine is compressed significantly when lifting weights. The quantity of these forces is dependent on the weight being lifted, how quickly it is being lifted, and the position of the trunk at any particular time. The interaction of these entities determines the strength of muscular contraction required for the accomplishment of the task [14].

Previous studies have shown that WRMDs are more common in young PTs and recent graduates, typically in the first five years of practice [6,11]. On the other hand, old aged PTs are less liable to injury as they are more involved in documentary work than manual practice [15]. Most previous research indicated that the most often reported area of injury among PTs [9-12]. Low back pain (LBP) can be caused by a number of factors, such as age, sex, heredity, obesity, environment, and occupation [16-18].

A number of occupational factors have been associated with low back pain (LBP), including fast-paced work environments, repetitive movement patterns, little recovery time, heavy lifting and other physically demanding tasks, non-neutral body postures, mechanical stresses, bending, twisting, vibrations, and low body temperature [19-20].

Static physical load (forced body posture), dynamic physical load (physical effort, monotype movements), and the possibility of falls are the main occupational risk factors for the locomotor system in the physiotherapy field. In general, the professional activities performed by PT are mainly physical work in combined planes. How they are performed determines the imposed body position. The repetitive short bursts of time spent in the same joints and forced positions over time cause significant strain on the locomotor system. As a result, there's a higher chance of strain or injury to the muscles, ligaments, and finally the intervertebral discs in the spine [2,21].

Physiotherapy (PT) comprises three main sections: kinesitherapy (movement therapy,

therapeutic gymnastics), physical therapy (treatment involving physical stimulation, either natural or produced by devices), and massage. In each of these departments, the PT has a different nature of work, which may cause different overloads in the locomotor system. The main threats that are specific

to a given specialty of physiotherapy include a mechanical overload of the musculoskeletal system (lifting patients, equipment, frequent repetition of the same movements); forced body position; bending and rotation of the torso with load; insufficient equipment for lifting and transferring patients; improper habits of lifting and carrying patients; unpredictable patient movements or falls. For the physical therapy specialty, it is routine and repetition of selected activities; the one-sided load on the musculoskeletal system; forced body position during the activity. For specialties, massage is a long-term leaning during the activity; mainly standing work; static physical workload with torso flexion and rotation; dynamic physical load - physical effort, monotone of movements [2,21]

So, this study was to determine the prevalence of lumbosacral radiculopathy among pediatric physiotherapists in the ministry of health in Cairo, Egypt. The authors hypothesize that there was no detected prevalence of lumbosacral radiculopathy among pediatric physiotherapists in the ministry of health in Cairo, Egypt.

**Methods**

**Study design**

**Cross section study; single group related measurement design.**

**Subjects:** Two hundred pediatric physiotherapists from both genders were participated in the current study. They were selected randomly from the Outpatient Clinic of pediatric physiotherapists of Hospitals of Ministry of Health in Cairo-Egypt, the duration of this study was six months started from December 2022 to June 2023. Inclusion criteria included the following a) The age of the subjects ranged from 25-40 years old; b) all subjects working in Ministry of Health in Cairo-Egypt; c) BMI <30. Subjects were excluded if a) they were with history of bone disease, renal, liver or endocrinal disorders; b) having lumbosacral radiculopathy before working as pediatric physiotherapists, c) having trauma in back or accident and pregnant pediatric physiotherapists were excluded. Informed consent form was signed by each subject. This study was approved by Ethical Comity of Faculty of Physical Therapy, Cairo University No: (P.T.REC/012/004394). With clinical trial ID (NCT06335732).

**Instrumentation**

**Evaluative equipment**

Recording data sheet: Name, gender, age, address, years of experiences (years), Work status, postgraduate training, direct question about having back pain and also about having leg pain, weight and height, visual analog scale, The Roland-Morris disability scale (RMS) for disability secondary to low back pain is a validated and popular instrument in clinical [22] practice, Modified Roland-Morris disability scale for leg pain (RMQ-L) and Straight Leg Raising (SLR) is widely used to diagnose lumbosacral nerve root irritation [22].

**Experimental procedures**

Through a personal visit of the first author to the outpatient hospitals in Cairo, the questionnaire was delivered personally to the pediatric physiotherapists and then researcher explained the aim of the study to the pediatric physiotherapists then the questionnaires were collected upon answering completion. Informed consent of scientific publication of the questionnaire provided data was included as a part of the questionnaire. If any of the pediatric physiotherapists in the hospital didn't fill out the questionnaire, a follow-up visit one week after the first visit was commenced to make sure all pediatric physiotherapists have the questionnaire and to collect newly filled out questionnaires.

Statistical analysis: Statistical analysis was performed using Statistical Package for Social Sciences program version 25. Descriptive results were generated by calculating the means and standard deviations. A Binary logistic regression was performed to determine the variables that can predict lumbosacral radiculopathy among the participants ( $p \geq 0.05$ ).

**Results**

Univariate analysis revealed that Age, BMI, working years, work hours per day and number of patients /day had a significant association with lumbosacral radiculopathy; while sex had not significant association with lumbosacral radiculopathy (Table. 1).

Subjects with age 30-37 years were 4.01 times more likely to have lumbosacral radiculopathy compared with subjects with age 25-29 years (Odds Ratio = 4.01, 95% CI 2.11-7.6,  $p = 0.0001$ ).

Subjects with obesity were 10.14 times more likely to have lumbosacral radiculopathy compared with subjects with normal weight (Odds Ratio = 10.14% CI 3.8-27.01,  $p = 0.0001$ ).

Subjects with working years 8-15 years were 4.39 times more likely to have lumbosacral radiculopathy compared with subjects with 1- 7 working years (Odds Ratio = 4.39, 95% CI 2.31-8.34,  $p = 0.0001$ ).

Subjects working > 4h/day were 4.57 times more likely to have lumbosacral radiculopathy compared with subjects working 2-4 h/day (Odds Ratio = 4.57, 95% CI 2.39-8.73,  $p = 0.0001$ ).

Subjects treated > 2 patients/day were 4.74times more likely to have lumbosacral radiculopathy compared with subjects working treated 1-2 patients/day (Odds Ratio = 4.74, 95% CI 2.09-10.73,  $p = 0.0001$ ).

Variables with significant association with lumbosacral radiculopathy were entered in multivariate logistic regression to identify the significant predictors for lumbosacral radiculopathy. Obesity, 8-15 working years and > 4 h/day were the significant predictors for lumbosacral radiculopathy ( $p < 0.05$ ) (Table 1)

**For Pain intensity**

**VAS: Visual analogue scale**

The mean  $\pm$  SD VAS of subjects with lumbosacral radiculopathy was 4.93  $\pm$  0.92 with minimum value of 3 and maximum value of 7.

**RMQS: Roland Morris questionnaire scale:**

The mean  $\pm$  SD RMQS of subjects with lumbosacral radiculopathy was 9.63  $\pm$  6.18 with minimum value of 0 and maximum value of 20.

**MRMQS: Modified Roland Morris questionnaire scale:**

The mean  $\pm$  SD MRMQS of subjects with lumbosacral radiculopathy was 10.93  $\pm$  4.17 with minimum value of 3 and maximum value of 18 (Table 2), (Figure 1).

**Discussion**

In The purpose of this study was to find out how common lumbosacral radiculopathy is among pediatric physical therapists. In this study, two hundred pediatric physical therapists took part.

In the present study the prevalence of lumbosacral radiculopathy among pediatric physiotherapists was 30.5% with 95% CI of 24.53- 37.2%. This result is comparable to [23] who found that among the 32 participants who have suffered from WRMD. Among them 23(40.6%) suffered in low back pain, 22(25.0%) suffered in neck & shoulder pain, 2(6.2%) suffered in upper back & neck pain, 5(15.6%) suffered in neck & back pain, 1 (3.1%) suffered in knee & ankle pain & 3(9.4%) suffered in mechanical pain. Occurrence of low back pain according to [24] in physiotherapist working in outpatient departments was 73.7% and in hospital settings was 50.4% [24]. Prevalence of neck and upper back pain in musculoskeletal physiotherapist according to [25] were 25% and 15% respectively [25]. In a prior study, the prevalence of WRMD among physiotherapists revealed that 62.73% of therapists had experienced WRMD symptoms in the previous year. In comparison to research published in the International Journal of Occupational Safety and Health (IJOSH) [26], this prevalence rate is higher. Concerns about their jobs among Queensland,

**Table 1.** Predictors of lumbosacral radiculopathy among participants.

Variables	Multivariate analysis			
	Odds ratio	95% CI	p-value	Sig
Age (30- 37 years)	1.67	0.59-4.7	0.33	NS
Overweight	1.02	0.44-2.38	0.95	NS
Obese	7.43	2.4-23.02	0.001	S
Sex (males)				
Working years (8- 15 working years)	3.93	1.37-11.31	0.01	S
Work hours per day (> 4 h/day)	2.84	1.21-6.68	0.01	S
Number of patients /day (> 2 patients/day)	2.551	0.9-6.97	0.07	NS

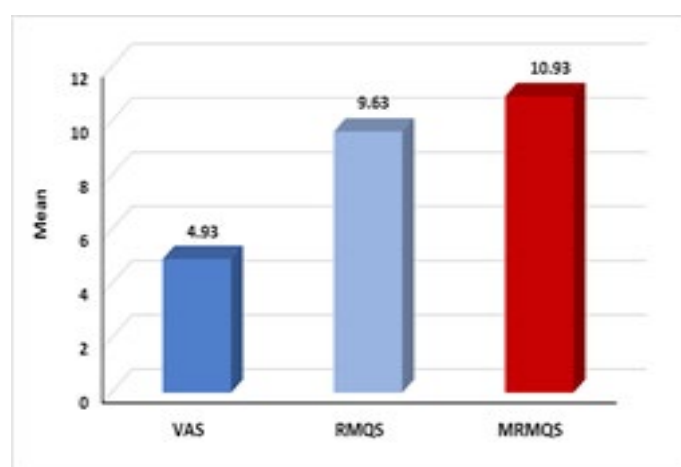
CI: Confidence interval, S, Significant, NS, Non-significant

**Table 2.** Mean VAS, RMQS and MRMQS in subjects with lumbosacral radiculopathy.

Variables	Univariate analysis			
	Odds ratio	95% CI	p-value	Sig
Age (30- 37 years)	4.01	2.11-7.6	0.0001	S
Overweight	1.17	0.57-2.43	0.65	NS
Obese	10.14	3.8-27.01	0.0001	S
Sex (males)	0.73	0.39-1.37	0.33	NS
Working years (8- 15 working years)	4.39	2.31-8.34	0.0001	S
Work hours per day (> 4 h/day)	4.57	2.39-8.73	0.0001	S
Number of patients /day (> 2 patients/day)	4.74	2.09-10.73	0.0001	S

	$\bar{X} \pm SD$	Minimum	Maximum	Range
VAS	4.93 $\pm$ 0.92	3	7	4
RMQS	9.63 $\pm$ 6.18	0	20	20
MRMQS	10.93 $\pm$ 4.17	3	18	15

$\bar{X}$ : mean SD: Standard deviation



**Figure 1.** Mean VAS, RMQS and MRMQS in subjects with lumbosacral radiculopathy.

California, Iowa, Jeddah, Kuwait, and Iowan physiotherapists [24] Nevertheless, compared to the study stated, other investigations discovered a greater prevalence of WRMD among physiotherapists [26].

The most often reported anatomical location of the body afflicted by WRMD, according to about 65.3% of respondents, was the low back, followed by the neck and shoulder. This is in line with a research that found that 99.5% of Egyptian physical therapists have WMSDs, with the lower back (69.1%), neck (65.7%), shoulder (47.7%), wrist/hand (39.1%), and upper back (37%) having the highest anatomical locations<sup>27</sup>. This result is also consistent with that of<sup>28</sup>, who discovered that the low back (45 percent), wrist/hand (29.6%), upper back (28.7%), and neck (24.7 percent) had the highest frequency of WMD among physical therapists.

The study group's mean  $\pm$  SD age was 29.37  $\pm$  3.17 years with a minimum of 25 years and maximum of 37 years in the current study. 112 (56%) subjects were 25-29 years old and 88 (44%) subjects were 30-37 years old. That agrees with [23] who found that among the 32 participants who have suffered from WRMD lowest age were 23 and highest age was 39 years. And frequency were 25.70% participants in between 20-25 years, 54.30% participants in between 26-30 years, 17.10% participants in between 31-40 years, 2.90% participants in between 36-40 years.

In this study the females with reported percentage of 60.5% while the number of males was 79 with reported percentage of 39.5% that agrees with the study of [23] who found that among the 32 participants who were suffered from WRMD 28 (40%) were male and 30 (60%) were female. Females are physically weaker than males in general, which may put them at a disadvantage while doing patient care tasks such as lifting and transferring patients. pregnancy-related stress affects females as well, with the lower back region being the most typically affected. Despite the fact that the current study did not include any pregnant therapists [25] claims that a history of pregnancy increases the incidence of WRMDs by causing changes in the spinal posture and a weakening of joint structure.

In a different study, there were 207 (54.0%) female therapists overall who had WMSDs, compared to 176 (45.9%) male therapists. Gender, except for upper back ( $p > 0.05$ ), shown a weakly significant connection with damage in all 5 relevant anatomic locations ( $V < 0.5$ ,  $p \leq 0.05$ ). With the exception of the upper back, female PTs had a greater incidence of WMSDs than male PTs in every anatomic site. The two biggest risk factors for WMSDs were heavy patient handling and habitual incorrect postures [27].

The present study was conducted to investigate the prevalence of lumbosacral radiculopathy among pediatric physiotherapists. Two hundred pediatric physiotherapists participated in this study. In the present study the prevalence of lumbosacral radiculopathy among pediatric physiotherapists was 30.5% with 95% CI of 24.53- 37.2%. This result is agreeing with [28] who found that among the 32 participants who have suffered from WRMD. Among them 13(40.6%) suffered in low back pain, 22(25.0%) suffered in neck & shoulder pain, 2(6.2%) suffered in upper back & neck pain, 5(15.6%) suffered in neck & back pain, 1 (3.1%) suffered in knee & ankle pain & 3(9.4%) suffered in mechanical pain.

Also this result is agreeing with [29] who showed that highest prevalence of WMD among physical therapists was in the following anatomical areas: low back (45%), wrist/hand (29.6%), upper back (28.7%), and neck (24.7%).

Studies show that treating a lot of patients in a single day, bending and twisting the spine awkwardly, working in static positions for extended periods of time, lifting or transferring heavy equipment and dependent patients during sessions, and not getting enough rest or breaks during the day are common risk factors for WMSDs in musculoskeletal physiotherapists. It is impossible to completely prevent or eradicate WMSD since certain risks (like heredity, for example) cannot be changed [30].

Studies have identified a number of risk factors for the development of pain and illnesses related to the workplace. Many risk factors may be present, including prolonged awkward static postures (stooping, slouching, ducking), improper placement, repetitive motions of the neck and shoulders, extended manual therapy application, and managing patient fears. Time constraints, age, gender, physical conditioning, genetic predisposition, mental stress, excessive demand, and inadequate social support [31].

These factors may account for the higher injury rates among female therapists compared to their male colleagues. Our results are in line with other research conducted in different nations, including Kuwait [32]. In Kuwait, 70% of people had experienced work-related pain in their lifetime [32]. Musculoskeletal problems are quite prevalent in the field of physical therapy. The ensuing pain-related illnesses severely interfere with day-to-day functioning and occasionally even need the PT to switch careers [33,34]. The primary cause of the initial pain episode was shown to be abdominal movements such lifting, tilting, and twisting. Similar outcomes were reported by other writers [21,35].

[36] revealed a different categorization of the study group and stated that, among PTs with expertise in emergency medicine, geriatrics, and pediatrics, the lower back and neck were the most afflicted body parts, while PTs with expertise in orthopedics and neurology claimed that the affected area of the body was the neck. In terms of job injuries, PTs employed in specialized nursing homes, clinics, and hospitals most frequently experienced lower back pain, whereas PTs working in academic and residential settings most frequently experienced neck pain.

Studies have shown inconsistent results, which could be explained by socioeconomic and cultural factors [25]. To determine whether there are any correlations between WRMDs and risk factors such age, gender, working

hours, and years of work experience, we conducted multivariate logistic regression analysis in this study. The number of years of physiotherapy practice experience and age were found to be significant predictors of WRMDs. Additionally, compared to their male counterparts, female physiotherapists have a higher risk of WRMD in the upper limbs, primarily in the shoulder and wrists. The latter has been validated by numerous writers [13,37,38].

#### Limitations of study

There are several restrictions on this study. Like with all cross-sectional designs, the results are limited to identifying risk factors. Furthermore, there may be some recall bias in the self-administered questionnaire. It is possible for participants to overlook any WRMD incidences. Furthermore, given how competitive the physiotherapy employment market is in Egypt, it's probable that some respondents exaggerated or even concealed their injuries to demonstrate their suitability for the position. Lastly, as we did not inquire about the degree of physical activity among our participants, it is plausible that physiotherapists who work with athletes vs those who do not suffer WRMDs at varying frequencies and degrees. Also, the sample was limited to the physiotherapy working for short time form 2-4 hours antreated only 1-2 patients /day and can't generalize the results of current research.

#### Conclusion

Among pediatric physical therapists, the prevalence of lumbosacral radiculopathy was found to be 30.5%. The study concludes that Egyptian physiotherapists have high rates of WRMDs, which are comparable to those of their international colleagues. Notwithstanding the social and cultural distinctions between Egypt and other nations, the results of our study were mostly in line with those of published reports. other investigation on the cultural and psychosocial dimensions of WRMDs among Egyptian physiotherapists may shed light on other problems and risk factors.

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