

A Cross-Sectional Study on Work-Related Musculoskeletal Disorders and Physiotherapy Knowledge in Educators: A Preventive Physiotherapy approach

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Abstract

Work-related Musculoskeletal Disorders (WMSDs) have become major occupational health problems among working populations across the world and their prevalence in the teaching profession is extremely high. In Malaysia, few studies are investigating on WMSDs among teachers and their awareness about physiotherapy, but in Sarawak, there is a lack of study available in this regard. Objective of the study is to determine the prevalence of WMSDs among secondary school teachers and their awareness level about physiotherapy in Sibu Sarawak, Malaysia. This cross-sectional study was conducted with convenience sampling of secondary school teachers from Sibu Sarawak, Malaysia. Validated self-administrated questionnaires (Nordic Musculoskeletal Questionnaire and Yong's Physiotherapy Awareness Questionnaire) were used. Data analysis was interpreted using SPSS version-23 software. Result suggested, A total of 330 secondary school teachers participated in this study. The prevalence of WMSDs in anybody site was 87.3%. The most affected body parts for past 12-months were neck (50.6%), lower back (43.0%), and ankles/feet (42.1%). For the past 7-days, the most affected body parts were lower back (67.6%), neck (61.2%), and upper back (38.8%). The least prevalence of WMSDs was elbow part. In terms of awareness about physiotherapy, 89.7% of participants were not aware about the role of physiotherapy. This study suggested that majority of the secondary school teachers were affected with WMSDs, particularly at neck and lower back region. Their awareness level about physiotherapy was considerably poor. Therefore, physiotherapy awareness should be raised among teachers to enable early identification and treatment of WMSDs.

Keywords: WMSDs; Prevalence; Secondary School Teachers; Awareness; Physiotherapy

Introduction

Work-related musculoskeletal disorders (WMSDs) represent work-related injuries or ergonomic injuries which include a wide range of inflammatory and degenerative conditions affecting the muscles, ligaments, tendons, joints, peripheral nerves, and supporting blood vessels that cause discomfort, pain and impaired functioning (Magee et al., 2016). Based on Resurgens Orthopaedics (2019), the most common body parts affected with WMSDs are the lower back, neck, shoulder, forearm, and hand. The clinical symptoms include pain, swelling, stiffness, numbness, tingling, aching or burning which can impact the ability in performing job-related tasks and activities of daily livings (ADLs). The most common musculoskeletal conditions are tenosynovitis, epicondylitis, bursitis, carpal tunnel syndrome, sciatica, and myalgia that arising from continuous, repetitive and unnatural movements in relation to work.

Globally, prevalence rates of WMSDs in school teachers ranges from 40% to 95% (Vaghela and Parekh, 2017). A systematic review reported a high occurrence of self-reported WMSDs among school teachers in country of Turkey, China, Australia, USA and Malaysia with a high probability of suffering neck, shoulder and back pain (Mesaria and Jaiswal, 2015). In Malaysia, it has been found out the prevalence of WMSDs to be at range of 40.4%-74.5% among

teachers (Ng et al., 2019). This is due to their physically high demanding job under unfavourable working circumstances such as prolonged standing and sitting; overstrained and awkward posture; prolonged static body position while using computer; prolonged head-down posture while correcting test papers; and psychological stress (Solis-Soto et al., 2017). Based on the 2017 Global Burden of Study, WMSDs can significantly impact the quality of life (QOL) and cause a major economic burden in compensation cost, treatment and lost wages. Without proper rest for pain recovery, aggravated pain symptoms can eventually lead to poor performance at work, high-level of sickness absenteeism and early retirement (Sirajudeen et al., 2018).

A study by Abdulmonem et al. (2014) on Saudi teachers' population showed that 38.1% of them had severe low-back pain throughout their whole life span; 31.9% had neck and shoulder pain; and 55.1% had lower limbs pain. This not only impacts their activities at work but also increases the risk of health problems, leading to chronic occupational disability. Besides, research of Erick and Smith (2014) in Botswana found out a higher prevalence rate of 83.3% in anybody site among teachers. Upper back, shoulder and neck were the most common reported musculoskeletal complaints which have caused some teachers to take sick leave for several days, while some required frequent medical attention due to discomfort and pain. A report in Philippines also documented a high overall prevalence of WMSDs at 74.5%, with legs and lower back having the highest rate because of the presence of significant risk factors within their work (Amit and Malabarbas, 2020).

Previous research by Argenan (2017) reported a high prevalence of WMSDs (96.23%) among teachers in Selangor with preponderance in the upper back, lower back, knee, and shoulder regions. For example, repetitive strain injuries in upper musculature of teachers are often the result of protracted posture and repetitive movement. Another study by Ng et al. (2019) in Kota Kinabalu revealed a high prevalence rate (61.7%) of WMSDs among school teachers as they reported discomfort in the preceding six months. The author concluded that the teachers are not paying much attention on the causes and impacts of WMSDs.

Nowadays, the health care sector including physiotherapy has been growing drastically. Physiotherapy is a healthcare profession that maintains, restores and improves the movement and physical function of a person in all age groups (Smith, 2017). Despite physiotherapists play a wide role across the world, the extent of awareness about physiotherapy among the public in some developing countries is still doubtful. Negative perception about physiotherapy that it deals with mostly massage and exercise only still exists. Few literatures revealed that there is a lack of complete understanding and comprehensive awareness about physiotherapy profession among the public, including school teachers (Paul and Mullerpatan, 2015). Based on Ponmathi et al. (2017), generally in most countries, only 48% of teachers were aware and had some knowledge about physiotherapy. This suggested that most of them were unaware of the field of physiotherapy profession and its applications in WMSDs management which can cause delay in early identification and management of various impairments, thus leading to permanent disabilities. Besides, 57% of the school teachers in India were not aware of the role of physiotherapy as most of them did not know what conditions need to be referred to a therapist (Rathod et al., 2018). It cannot be denied that lack of awareness of physiotherapy among teachers is more prone for WMSDs.

Since the population of school teachers in Malaysia is getting larger and numerous studies have revealed that teachers are more susceptible to WMSDs. However, there is a paucity of literature on the prevalence of WMSDs and awareness level about physiotherapy among school teachers in Sarawak, Malaysia. Therefore, this study assessed prevalence of WMSDs among secondary school teachers and their awareness level about physiotherapy in district Sibu, Sarawak Malaysia. These will establish better practical guidelines towards the prevention and management of WMSDs in the teaching profession. So, the rate of WMSDs can be reduced among the school teachers.

Literature Review

Work-related musculoskeletal disorders (WMSDs) are prevalent among teachers due to prolonged static postures, repetitive tasks, and ergonomic challenges in the classroom environment. Studies have shown that teachers frequently report neck, shoulder, and lower back pain, which can impact their job performance and quality of life. Despite this high prevalence, there is limited awareness and application of preventive strategies rooted in physiotherapy knowledge among educators. Existing literature highlights a gap in the integration of physiotherapy-based ergonomic education and self-management techniques in this population. A better understanding of this knowledge gap is crucial for designing targeted interventions to reduce the burden of WMSDs in teachers.

Methodology

This cross-sectional study was conducted using convenient sampling technique to gather data from 20 public secondary schools in the district of Sibu Sarawak, Malaysia in relation to the prevalence of WMSDs and the awareness level about physiotherapy among teachers. This study has been approved by Ethical Board Review from Mahsa University. Inclusion criteria were both female and male secondary school teachers with age group of 25-45 years, full time teaching (8hours/day in 5 days) and at least has 1 year teaching experience. Those teachers who are pregnant, diagnosed with malignancy, deformity, rheumatoid arthritis, ankylosing spondylitis, and involved in recent

fracture or surgery were excluded. Total sample size required for this study is 384 based on standard normal deviation set at 95%, confidence level (1.96), percentage picking a choice or response (50% = 0.5) and the confidence interval (0.05) (Ishmael, 2014).

Nordic Musculoskeletal Questionnaire (NMQ) was used to evaluate general musculoskeletal system health problems at different body positions over the last 12-months and last 7-days. It is a valid and reliable instrument with 92% sensitivity and 88% specificity (Crawford, 2007). Besides, self-developed questionnaire (Yong's Physiotherapy Awareness Questionnaire) was used to assess the awareness level about physiotherapy among secondary school teachers. It composed of seven close-ended questions that assess awareness on a five-points Likert-scale ranging from fully aware to fully not aware. It has been reviewed by few physiotherapy lecturers and their comments were integrated into the questionnaire. This can establish a good validity and reliability of the questionnaire in this research. A pilot study was done among secondary school teachers to test the feasibility and applicability of the study. The data obtained showing that the questionnaire was valid ($p < 0.05$). Due to covid-19 pandemic, questionnaire was administrated via Google Docs software. All the questionnaires, information sheet and consent form were prepared by using Google Form. Instructions for each questionnaire and the procedure of filling the questionnaire were stated clearly in the Google

The collected data was interpreted and analyzed using Statistical SPSS version-23 software. Descriptive statistics were produced using frequency, percentage and mode to summarize demographic characteristics, the prevalence of WMSDs and awareness level about physiotherapy among secondary school teachers.x

Results

TABLE 1: DEMOGRAPHIC DATA COLLECTED

GENDER	FREQUENCY	PERCENTAGE (%)	MODE
MALE	112	33.9	FEMALE
FEMALE	218	66.1	
AGE	FREQUENCY	PERCENTAGE (%)	MODE
25-30	48	14.5%	36-40
31-35	90	27.3%	
36-40	115	34.9%	
41-45	77	23.3%	

Table 1 showed the demographic characteristics of participants. A total of 330 secondary school teachers participated in the study, which comprised of 112 (33.9%) males and 218 (66.1%) females, aged between 25-45 years old.

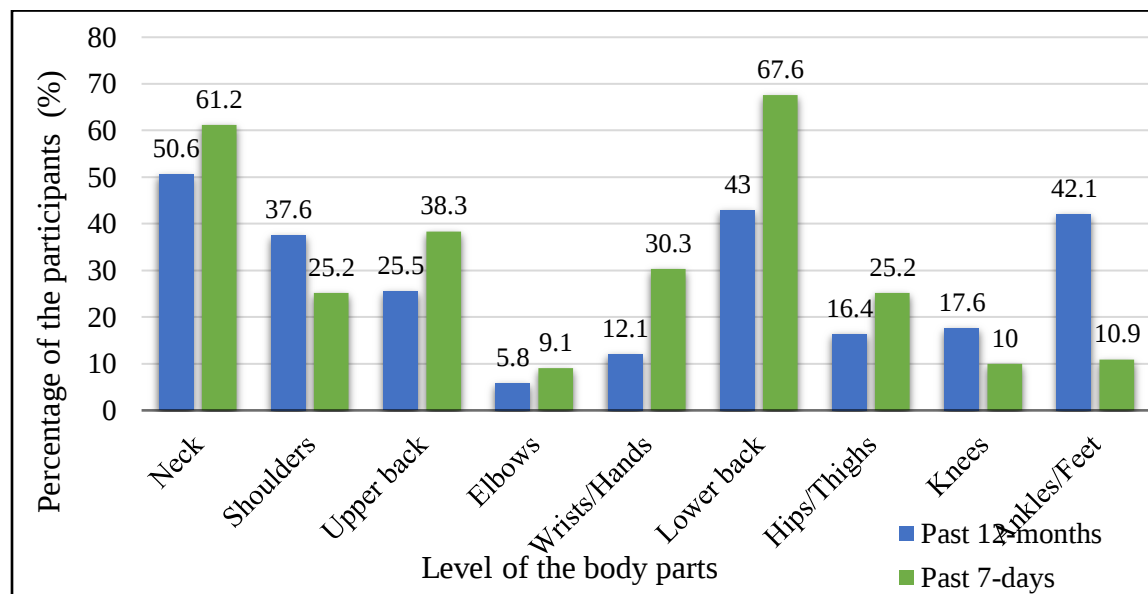


Figure 1: Past 12-Months and 7-Days Prevalence of WMSDs (NMQ)

Results above were the analysis from NMQ which involves nine body regions. The main result of this study showed that the overall prevalence of WMSDs in anybody region among secondary school teachers was as high as 87.3% (n=288). Only 12.7% (n=42) teachers were free from any WMSDs from all the nine body regions. This indicated that teachers are at high risk of developing musculoskeletal conditions.

Figure 1 demonstrated the distribution of the prevalence of WMSDs in relation to symptoms (such as ache, pain, discomfort, numbness) during the last 12-months and last 7-days. In the past 12-months, the most affected body part was neck (50.6%), followed by lower back (43.0%), ankles/feet (42.1%), shoulders (37.6%), upper back (25.5%), knees (17.6%), hips/thighs (16.4%), wrists/hands (12.1%), and elbows (5.8%). Neck complaint was the top of ranking of chronic WMSD. In the past 7-days, the most affected body part was lower back (67.6%), followed by neck (61.2%), upper back (38.8%), wrists/hands (30.3%), shoulders (25.2%), hips/thighs (25.2%), ankles/feet (10.9%), knees (10%), and elbows (9.1%). Low back pain was the highest prevalence while the elbows was the least prevalence of WMSDs.

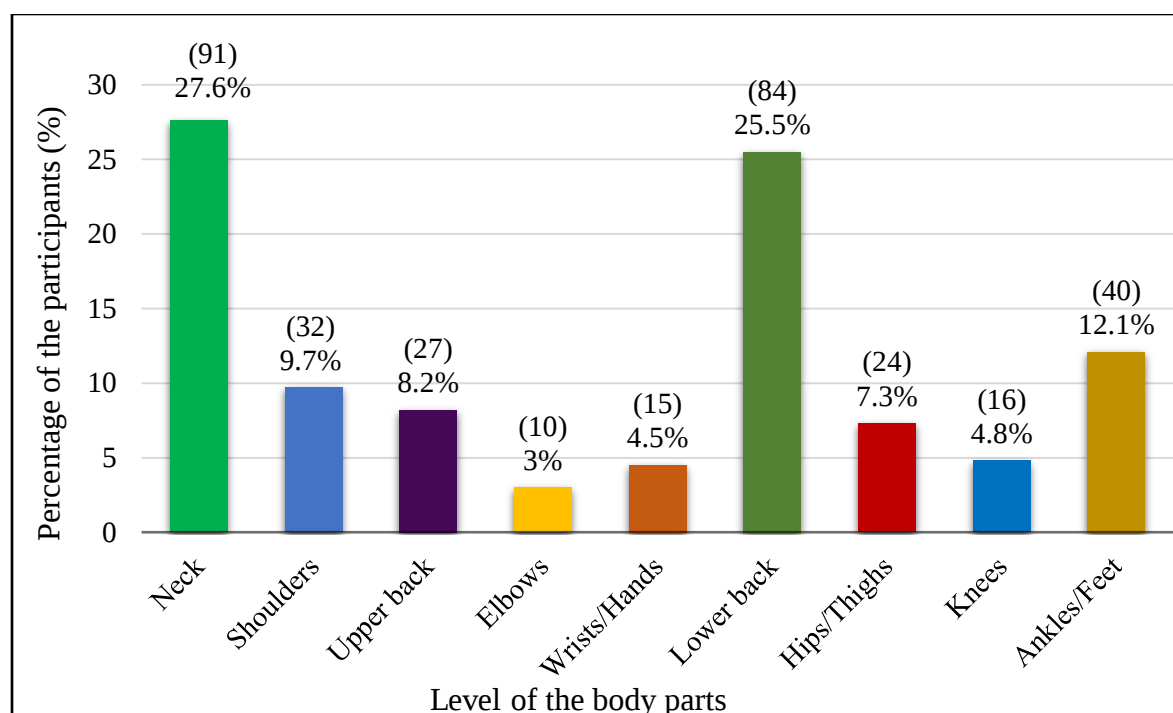


Figure 2: Limitation in Normal Activities during Past 12-Months (NMQ)

Figure 2 investigated whether the normal activities (such as housework, job, hobbies) were being affected among the teachers because of WMSDs. In general, about half of the participants with WMSDs had trouble in carrying out normal activities, which adversely impact their QOL. Chronic neck and low back pain had the highest impact in preventing teachers from performing their normal activities in daily life at 27.6% and 25.5 % respectively. The least disrupting forms of WMSDs in relation to carrying out normal tasks were elbows, wrists/hands and knees.

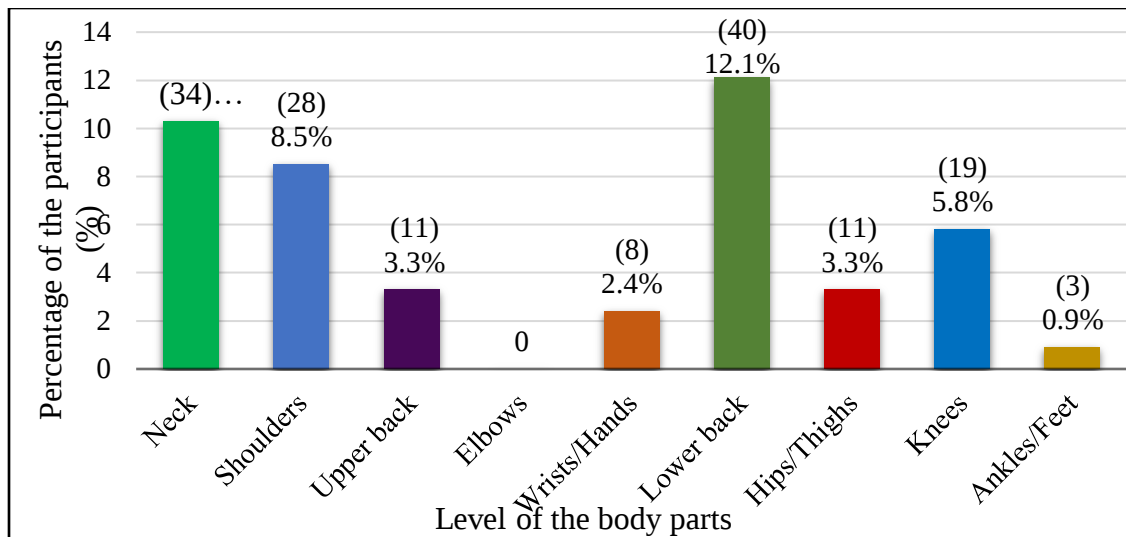


Figure 3: Seen a physician during Past 12-Months (NMQ)

Figure 3 demonstrated the number of participants who seen a physician for musculoskeletal condition in the past 12-months. In general, only a quarter of the participants with WMSDs visited a doctor for their musculoskeletal symptoms. Medical visits were occurred more often in participants with chronic neck and low back pain.

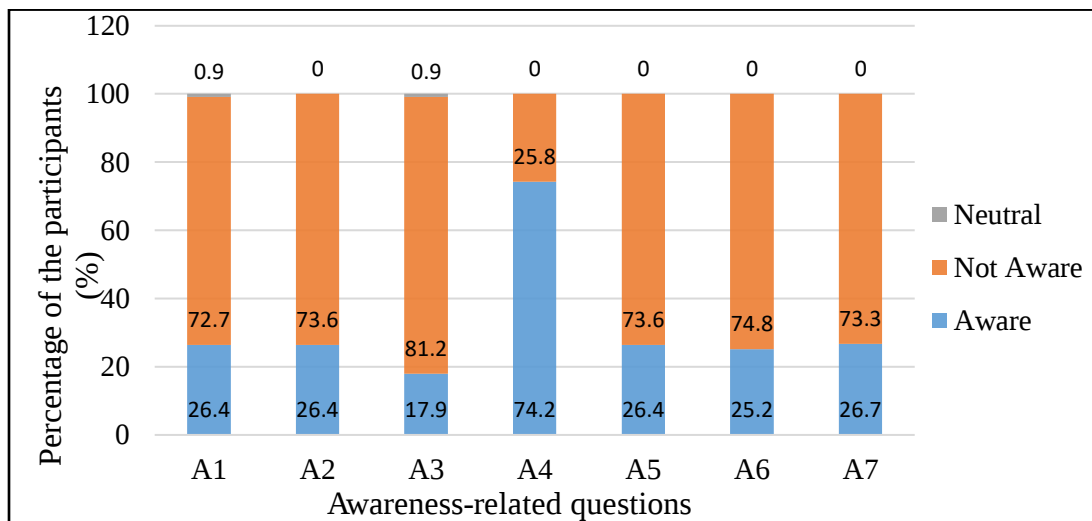


Figure 4: Awareness Level about Physiotherapy among Participant

Figure 4 demonstrated the analysis from Yong's Physiotherapy Awareness Questionnaire which composed of seven-questions. Based on the overall results, surprisingly, 89.7% of secondary school teachers were not aware of physiotherapy. Only 10.3% of them have a complete understanding about physiotherapy profession.

72.7% of teachers did not know about the various specialty areas in the field of physiotherapy. Next, the awareness about the physiotherapist has ability in diagnosing musculoskeletal conditions was very poor. Only 26.4% of teachers were aware that physiotherapist is capable in providing clinical diagnostic for musculoskeletal condition. Similarly, only 26.4% of teachers were aware that physiotherapist provides treatment for patients with WMSDs.

Table 2: Awareness about Physiotherapy among Participants

NO	QUESTIONS	RESPONSES FROM PARTICIPANTS (%)		
		Aware	Not aware	Neutral
A1	Are you aware that physiotherapy comprised of various specializations (cardiorespiratory, musculoskeletal, neurology, sports rehab, woman health)?	26.4	72.7	0.9
A2	Are you aware that physiotherapist is capable in diagnosing musculoskeletal conditions such as low back pain, shoulder pain, hip pain and knee pain?	26.4	73.6	0
A3	Are you aware a fact that a person can directly visit the physiotherapist without referral from a doctor?	17.9	81.2	0.9
A4	Are you aware that physiotherapy services are available at government and private hospitals, Rehab centres?	74.2	25.8	0
A5	Are you aware that physiotherapist treats work-related musculoskeletal injuries?	26.4	73.6	0
A6	Are you aware that physiotherapist provides ergonomic education and advices to office workers?	25.2	74.8	0
A7	Are you aware the role of physiotherapist in promoting workplace safety and injury prevention strategies?	26.7	73.3	0

Among the seven-questions of the questionnaire, most of the teachers (81.2%) were not aware that a person can directly see a physiotherapist for an injury without a referral from a physician. However, up to 74.2% of the teachers had awareness about the availability of physiotherapy services in the government and private hospital hospitals as well as in the Rehab center. Besides, very few teachers (25.2%) believed the role of physiotherapists involve in ergonomic education for office workers. Similarly, only a few teachers (26.7%) were aware about the expanding role of physiotherapists in promoting workplace safety and injury prevention strategies.

Discussion

This study has explored WMSDs as a significant health issue for secondary school teachers in Sibul Sarawak, Malaysia. Results showed that 87.3% of the teachers had WMSDs in any part of the body, implying that musculoskeletal problems occur in over 8 out of 10 teachers. This prevalence was almost equivalent to previous studies among teachers in Kenya (85.1%) (Ndonye et al., 2019), in Taiwan (86%) (Cheng et al., 2016) and in Bolivia (86%) (Solis-Soto et al., 2017). This prevalence rate falls within the range between 40% and 95% as reported in a systemic review on WMSDs in the teaching profession (Erick and Smith, 2011).

Neck and lower back were reported as the most affected body regions for WMSDs during the previous 12-months and previous 7-days. This result was parallel to a research finding conducted in Selangor among school teachers, with the back and neck being the most prevalent regions of symptoms (Argenan, 2017). A study on musculoskeletal pain among Indian school teachers also recorded the same result, where the neck and lower back were found to be the highest in prevalence (75%) (Thaseen and Tantry, 2019). Tami et al. (2021) pointed out that a significant percentage of teachers complaint neck and low back pain may be attributed to their high physical demanding job that were carried out under unfavorable working conditions, including awkward postures and lack of back support while seated.

The third category in terms of prevalence was ankles/feet during the past 12-months and upper back during the past 7-days. The prevalence rate of ankles/feet pain during past 12-months was almost similar to that reported by teachers in Saudi Arabia (42.8%) (Alqahtani, 2020). This may be explained by that teachers spend more than 50% of total working hours in the standing position during classroom teaching, which can contribute to varicose veins (Alias et al., 2020). However, the prevalence rate of upper back pain during the past 7-days was relatively higher than that recorded in Terengganu (27.4%) (Alias et al., 2020) and in India (29.97%) (Vaghela and Parekh, 2017). The possible reason for this is that the teachers nowadays are working from home during pandemic where they spend most of their working hours in front of the computer in a static sitting position with forward bending of neck and upper back, which increase the loading on spine structures. With time, those habits of bad posture have becoming part of their daily lives which results in chronic musculoskeletal problems.

When looking at the relevance of past 7-days and past 12-months WMSDs, this study showed that the prevalence of WMSDs during the past 7-days was slightly higher than that of the past 12-months. This increased number of WMSDs problems is probably due to the fact that their working pattern has been changed nowadays. They are working via online education at home during covid-19 pandemic that requires prolonged sitting positions and excessive use of

computers. A recent study by Erdi et al. (2021) revealed that musculoskeletal and psychosocial issues have increased in teachers during their online teaching and they remained inactive at home which causes many health problems. Without seeking treatment from physiotherapists, this would further exacerbate their musculoskeletal condition and lead to lifelong consequences.

Chronic neck and low back pain were recorded as the top form of WMSDs that had prevented teachers from carrying normal activities during the past 12-months. This finding was parallel to a research finding of Ndonye et al. (2019). A study by Murugan et al. (2021) concluded that WMSDs have the potential effect to interfere more than 50% of teachers' working abilities in their workplace as well as their ADLs due to the presence and severity of symptoms. This may diminish the efficiency of work in teachers as they might not be able to be involved actively in the teaching team. Previous research also hypothesized that musculoskeletal problems were the root cause of long-term sick leave in school teachers (Erick and Smith, 2014). Results also showed that only about one-quarter of teachers had seen a doctor because of musculoskeletal symptoms in the past 12-months. This concludes that they tend to ignore their musculoskeletal problems in a long run.

In regards to awareness level about physiotherapy among secondary school teachers, the study revealed that only a small fraction of the population (10.3%) have a comprehensive awareness about physiotherapy. This finding was in the contrast with the finding of Ponmathi et al. (2017) in India, which showed that 48% of teachers were aware about physiotherapy and its application. Another similar study by Rathod et al. (2018) also showed that 81% of teachers were aware of physiotherapy services. This clearly indicates that majority of the teachers with WMSDs in Malaysia were less aware about the role of physiotherapists which is quite alarming as this may indirectly hamper the growing of this profession.

It was observed that 78.2% of teachers were not familiar with the roles of physiotherapists in various fields such as neurology, cardiorespiratory, musculoskeletal, woman health and others. This puts forward the need to enhance their understanding of the development and diversity of physiotherapy in various areas so that they will aware about the conditions that a physiotherapist can deal with. Besides, many teachers were not aware whether physiotherapist has the capability to diagnose and treat WMSDs. The study of Erick and Smith (2014) discovered that less than half of teachers took physiotherapy treatment as a coping strategy to overcome musculoskeletal symptoms. Zangata et al. (2020) stated that most people were of the view that physiotherapist mainly assists medical work and can only plan treatments in conjunction with physicians. Because of the lack of awareness, people with musculoskeletal pain usually resort to self-medication (taking analgesics) for quick relief of pain and often delay in seeking proper treatment which could lead to worsening of symptoms and poor prognosis. Studies have proven that physiotherapy can be a safer and effective alternative than any other invasive therapy for many conditions and injuries (Rathod et al., 2018).

According to the results, the belief that a doctor's referral is required before seeking a physiotherapist is the biggest misconception among school teachers (81.2%). A survey by Rathi and Chandra (2020) in India reported that only 46% population directly approached physiotherapists as their first contact practitioner. This shows that the majority of them were not aware about physiotherapy can be their first choice of health care services and this may lead to underutilization of skills and resources of this potential profession. In fact, a person with pain can directly benefit from early physiotherapy treatment without going through a long referral process, which can lead to faster recovery. Moreover, a greater proportion of the participants knew about physiotherapy services can be received in government and private hospitals as well as Rehab centers. But some were still not aware of this. A review by Paul and Mullerpatan (2015) on physiotherapy awareness across the globe concluded that many people have probably heard about physiotherapy but they do not know what actually physiotherapists do during the treatment session. Many people just assumed that physiotherapists only do massage. In fact, physiotherapy is more than just a massage. They are one of the important roles in primary health care who apply a variety of skills and techniques such as manual therapy, electrotherapy, hydrotherapy, dry needling, exercise prescription and many. Hence, adequate information should be conveyed amongst the participants to raise their awareness regarding physiotherapy.

It was inferred that majority of the teachers were not much aware that a physiotherapist is an ideal professional to provide ergonomic education and advices to office workers. Also, they did not know that physiotherapist plays a greater role in promoting workplace safety and injury prevention strategies for employees. This may suggest that they were not aware the consequences of not practicing the ergonomics in the workstation such as the correct position between the eyes and computer, comfortable body position between chairs and desk as well as the hand position during work. A study by Halmi and Zajmi (2017) reported that the awareness of ergonomics and working posture among school teachers in Malaysia was poor and this put them at high risk of developing WMSDs. This significant finding requires the attention of physiotherapists to extend their role in educating teachers to maximize the practice of ergonomics in their daily life and avoid certain risk factors like poor habitual posture.

The overall awareness assessment of secondary school teachers in this study was unsatisfactory. This finding could be attributed to lack of information on the scope of physiotherapy practice, and shortage of physiotherapy centers in the study environment, thereby making the general public hesitated in seeking physiotherapists for their health conditions. However, their awareness of physiotherapy could be improved if essential information is given through

medical professionals to enhance the accessibility to physiotherapy services. School teachers also can be a good source of creating public awareness about physiotherapy and referring needy people to physiotherapy

There are some limitations detected in this study. Self-report questionnaires using Google Form might cause results bias due to their being completed by participants, rather than by a specialist who could provide a more objective and clinically-based diagnosis for musculoskeletal conditions. Moreover, the study was cross-sectional in which the data was collected at one specific time only, so there were no inferences of causality can be established between WMSDs and physiotherapy awareness. As school visitation was not allowed due to pandemics, there is no chance to observe the physical school environment and the working nature of school teachers.

Conclusion

The findings of this study revealed a significant prevalence of WMSDs among secondary school teachers which had prevented a considerable number of teachers from carrying out their normal activities and seek a physician. Interestingly, here it has proven that the awareness level about physiotherapy among teachers was low. They still have wrong perceptions regarding physiotherapy profession. This highly emphasizes the need of educating school teachers on the importance and usefulness of physiotherapy medical practice which helps them in early intervention for their musculoskeletal disorders and prevention of permanent disability.

It is recommended that experimental study can be conducted in the future among the teaching profession to provide better physiotherapy treatment for them. Effective intervention strategies should be properly educated to prevent further musculoskeletal disability and hence improve their QOL. Further research can also be carried out in different working populations like factory workers or office workers to determine their prevalence of WMSDs and awareness level about physiotherapy so that necessary action can be taken to minimize the risk of developing work-related injuries and disorders among those populations.

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Informed Consent: Informed consent was obtained from the participants and they have signed a declaration of informed consent.

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