International Journal of Research and Review
Vol. 9; Issue: 3; March 2022
Website: www.ijrrjournal.com
Review Article *E-ISSN: 2349-9788; P-ISSN: 2454-2237*

Prevalence, Risk Factors and Prevention of Work-Related Musculoskeletal Disorders in Physiotherapist According to Their Specialization - A Review

Manali K Shah[1], Ruchi G. Desai[2]

[1,2]Assistant Professor, L J Institute of Physiotherapy, L J University, Ahmedabad

Corresponding Author: Manali K Shah

DOI: https://doi.org/10.52403/ijrr.20220354

ABSTRACT

Physiotherapists are primary health care Professionals who diagnose and treat individuals of all ages, who have medical problems or other health related conditions, illness, or injuries that limit their abilities to move and perform the daily functional activities. Our aim was to review current knowledge associated with prevalence, risk factors, and preventive strategies of WMSDs among physiotherapist according to their work of specialization. Google Scholar and PubMed were searched for terms relating to WMSDs in Physiotherapists of various specialization from inception to 2021. There are many physiotherapy specialties including musculoskeletal, pediatrics, neurological, cardio- respiratory, rehabilitation, sports etc. and each one has its unique purpose and set of responsibilities. According to area of specialization in physiotherapy, occurrence of WMSDs at different body part may vary. Therefore, implementing preventive strategies for WMSDs in early stage of a physiotherapist's career according specialization is needed.

Key Words: work-related musculoskeletal disorders, Physiotherapy, Neuro-physiotherapy, Cardiopulmonary Physiotherapy, Musculoskeletal Physiotherapy, Sports Physiotherapy.

INTRODUCTION

Physiotherapy is a rehabilitation science which aims to restore movement and function of an individual who is affected by injury, illness or disability. According to The World Confederation for Physical Therapy (WCPT) **"**Physical therapy is services provided by physical therapists to individuals and populations to develop, maintain and restore maximum movement and functional ability throughout the lifespan."[1] According to world health organization (WHO) "Physiotherapist apply a broad range of physical therapies and techniques such as movement, ultrasound, heating, laser and other techniques. They may develop and implement programmes for screening and prevention of common physical ailments and disorders."[2]

Physiotherapy is a complex speciality, as it deals with all disciplines of medicine. Development in this field has resulted in a variety of sub-specialization. According to specialization, different branches of physiotherapy are musculoskeletal physiotherapy, cardiothoracic physiotherapy, neurologic physiotherapy, physiotherapy in rehabilitation, physiotherapy in obstetrics and gynaecology, sports physiotherapy, paediatric physiotherapy etc.

In a physiotherapy practice nature of the work is physically demanding. Work of physiotherapist involves repetitive tasks, high force manual techniques for treating patients, techniques that exert direct pressure on certain joints during treatment,

awkward positioning of joints during certain manoeuvres and prolonged constrained postures.[3-5] These physical factors expose physiotherapists to various work-related musculoskeletal disorders (WMSDs) [6].

Most WMSDs develop over time and are caused either by the work itself or by the employees' working environment. The three most important risk factors that have been associated with WMSDs are repetitive tasks, uncomfortable postures and high force levels.[5] The nature of work in physiotherapy practice also varies depending on specialization as neuro physiotherapists routinely perform activities such as transferring dependent patients, performing passive or assisted exercises and assisting with mat activities, while musculoskeletal physiotherapist may perform more of manual therapy, stretching and lifting heavy equipment.

Globally it has been reported that physiotherapists are at high risk of WMSDs, with the Low back as the major body part affected followed by neck and upper back region, shoulder, wrist, knee, thumb and fingers, hip, elbow and legs and toes.[7-11] Many studies have found and suggested risk factors and prevention of it in physiotherapist in general. But according to area of specialization in physiotherapy occurrence of WMSDs at different body part may vary as each speciality have unique role and purpose. This study has reviewed current knowledge associated with prevalence, risk factors, and preventive strategies of WMSDs among physiotherapist according their work of specialization.

MATERIALS AND METHOD

Cromie JE et.al (2000),[14] Bindu PH et.al (2014),[3] Milhem et.al (2016),[15] Ramanandi V et.al (2021),[9] Karanikas N et.al (2021)[20] etc. studies have assessed and demonstrated high prevalence of WMSDs among physiotherapist. General risk factors and prevention strategies of WMSDs among physiotherapist have also been described by various studies. But according to area of specialization in physiotherapy occurrence of WMSDs may vary as each speciality have unique role and purpose. The aim of this study was to review current knowledge associated with prevalence, risk factors, and preventive strategies of WMSDs among physiotherapist according to their work of specialization.

A systematic search was conducted from the Scopus, Web of Science, PEDro, EMBASE, MEDLINE, Google Scholar and PubMed (NML) databases until January 2022 using a predefined strategy for the following key words: work related musculoskeletal disorders, physical therapists, physiotherapists, prevalence, risk factors, prevention strategies, musculoskeletal physiotherapy, neuro physiotherapy, cardio respiratory physiotherapy, sport physiotherapy, paediatric physiotherapy, physiotherapy in obstetrics and gynaecology, rehabilitation. There were no publication data limitations. Titles and abstracts of all relevant articles were reviewed. The reference lists of all the retrieved articles were also searched.

Inclusion criteria for this study was: (1) studies written in English (2) studies dealing with WMSDs in PTs (3) study type randomised control trials only.

The articles not related to WMSDs in PTs, were published in other languages and with unavailable full text were excluded. Articles and references were analysed logically and conclusion was drawn for this narrative review.

RESULT

Details of studies related to Prevalence of WMSDS according to specialization of Physiotherapy have been mentioned in Table 1. To make recommendations based on a high level of evidence (1a), this review included only randomised control trials.[37]

Table 1: Summery of studies included in this study.

Specialization	Study	Study group (n)	Work setup	Prevalence (pain in last 12 months)
Physiotherapy in Musculoskeletal Conditions	Rugelj D [12]	113	OPD	LBP (73.7%)
			hospital settings	LBP (50.4%)
	Buddhdev & Kotecha[5]	20	OPD	Neck (25%) Upper back (15%)
	G. Rossettini et al.[16]	219	OPD	Thumb (49.3%)
Physiotherapy in Cardiorespiratory Conditions	Santos RM et al.[18]	18	ICU	Neck (27%) LBP (18%)
			Ward	Neck (14%)
	Yang S et al.[19]	702	ICU	LBP (80.1%) Neck (78.6%) Knee (37.4%)
Physiotherapy in Neurological Conditions	Bork BE et al.[25]	928	hospital-based settings	LBP (45%)
	Molumphy et.al [26]	344		LBP (29%)
	Cromie JE et al. [6]	824	OPD and home-based rehabilitation	neck, upper back and upper limbs followed by low back pain (42%)
Physiotherapy in Sports	Ju YY et al.[32]	146	Sports field	LBP (42%), Finger (38%), shoulder (26%)
Physiotherapy in Paediatrics	Atia DT et al.[33]	106	OPD	neck (63.2%), shoulder (58.5%), wrist and hand (56.6%), knee (53.8%)

Note: OPD= Outpatient departments, LBP= Low back pain

DISCUSSION

Physiotherapist are an integral part of health care team, restoring and optimizing movement and function after injury or diseases. There are many physiotherapy specialties to consider, and each one has its unique purpose and set of responsibilities. The lifetime prevalence of WMSDs in many studies was high in physiotherapist. This study reviewed specialization wise prevalence, risk factors and preventive strategies of WMSDs in physiotherapist.

Physiotherapy in Musculoskeletal Conditions:

Musculoskeletal physiotherapist helps restore movement and function when someone is affected by injury, illness and disability. They maintain health for all age of people, helping patients to manage pain and prevent disease. They perform assessment, diagnosis and evidence-based management of all musculoskeletal conditions. Approaches used in musculoskeletal physiotherapy are manipulation, specific therapeutic exercises, electrotherapy, advice on posture and movement disorders etc. Musculoskeletal physiotherapists work at various places like hospitals, public healthcare centers, outpatient departments, gymnasiums etc.

Musculoskeletal Physiotherapist are reported to be at high risk of WMSDs, the common body part affected are Lower back, followed by neck and upper back region, shoulder, wrist, knee, thumb and fingers, hip, elbow, legs and toes.[7-11]

Occurrence of low back pain according to Rugelj D in physiotherapist working in outpatient departments was 73.7% and in hospital settings was 50.4%.[12] Prevalence of neck and upper back pain in musculoskeletal physiotherapist according to Buddhdev & Kotecha were 25% and 15% respectively.[5] According to studies common risk factors for WMSDs in musculoskeletal physiotherapist are treating large number of patients in a single day, bending and twisting the spine in awkward position, working in static positions for longer periods, lifting or transferring heavy equipment and dependent patients during sessions, lack of enough rest or break during the day. It is not possible to eliminate/prevent WMSD because they are multi-factorial, and some risks are non-modifiable (e.g., genetics).[13]

Proper patient handling combined with the use of patient transfer equipment (e.g., lifts), get other person's help during

treatment, modifying position of patient or therapist and regular practice of physical activity have been found to reduce pain in healthy professionals. Preventive strategies during activities such as manual therapy, manually resisted exercises and assisted stretches, adequate body mechanics as well as other strategies like change in posture, adjust bed height, use of aids and equipment, using a different body part and substituting electro therapy etc. are needed to minimize load.[14,15] To reduce the burden of workload, physiotherapists could take breaks/recovery time between patients, and arrange patient's appointment alternately between more and less physically demanding patients.

Strengthening exercises of core and lower extremity should be performed by therapist to maintain physical fitness and various self-stretching exercises should be done at regular interval to prevent muscle strain and soreness as well as to prevent WMSDs in future.

Physiotherapists who are performing more manual therapy techniques like traction, trigger point ischemic compression, mobilization of limb and manipulation of spine, therapeutic massage, myo-facial release etc. often experience thumb pain. G. Rossettini et al. reported 49.3% of physiotherapist performing manual therapy experienced thumb pain at least once in the last 12 months.[16] Risk factors for development of thumb pain are working in the non-ergonomic position for long duration, continuing to work with sore thumb, repetitive use of dominant thumb, heavy work load on single physiotherapist for giving same technique frequently. Preventive and management strategies for thumb pain in manual therapists are altering the practice techniques, changing position frequently, introducing breaks in the work schedule or reducing continuous work hours on patient and performing stretching of thumb before treatment and for sore thumb use brace or splinting, give rest and take proper medical and physiotherapy treatment before using it for giving manual therapy.[16,17]

Physiotherapy in Cardio Respiratory Conditions:

Cardiorespiratory physiotherapy is an area of physiotherapy that specialises in the prevention, rehabilitation, and compensation of clients with diseases and injuries in the heart and lungs. Common cardiorespiratory conditions often treated by cardiorespiratory physiotherapist are Chronic Obstructive Pulmonary Disease (COPD), Asthma, Bronchiectasis, Bronchitis, Emphysema, Congestive Cardiac Failure (CCF), Respiratory Infections, i.e., Pneumonia, Hypertension, Peripheral Vascular Disease, Heart diseases, Heart or lung injury or surgery etc. The major role of cardiopulmonary physiotherapist is in ICU, in hospital wards and in cardiac rehabilitation centres.

In ICU most of the critical patients are bed ridden, requires more comprehensive care and constant monitoring. Patients in ICU usually have poor ability to care for themselves and are severely weak.so they are more dependent on health care workers like doctors, nursing staff, physiotherapist etc. Cardiorespiratory physiotherapists are involved in various aspects of respiratory care—including secretion mobilization, adjusting ventilator settings, weaning, extubation, and initiating and supervising non-invasive ventilation (NIV)—as well as patient mobilization and positioning.

In a recent study, Santos RM et al. have found 55% of physiotherapists working in ICU had reported WMSDs in last 12 months, and the higher prevalence was in the neck region followed by low back region.[18] Many previous Studies have shown higher prevalence of WMSDs in healthcare professionals working in ICU affecting Low back, neck and knee region.[19] The potential biomechanical risk factors for development of WMSDs in cardiorespiratory physiotherapist is owing to physical workload of transferring or

changing position of bed ridden patient frequently, performing postural drainage, manual therapy and respiratory manoeuvres for removal of secretion and performing passive movement of upper and lower extremity of patients. These require physical strength and standing for long hours in a day. Repetitive activity of physiotherapist in awkward position, taking load of patient's extremity on own spine as well as twisting and bending in non-ergonomic position of spine leads to upper and lower back pain.

For preventing WMSDs in cardiorespiratory physiotherapist when handling patients, it is essential to use appropriate handling techniques with necessary assistance from other ICU staff, adjust the height of bed according to physiotherapist height, wear loose and appropriate clothes which allows physiotherapist to move freely and reduce friction between skin and clothes, appropriate footwear should also be used, e.g., low heels and non-slip soles while handling patient in standing for long periods. Another preventive strategy is to use breaks at regular interval and plan treatment schedule between less and more dependant patient alternately.[18]

Patients in hospital wards or referred to cardiac rehabilitation centres are less dependent on physiotherapist then in ICU. WMSDs in cardiorespiratory physiotherapists working in wards and cardiac centres is found less. But still, they should follow preventive strategies by focusing on prescribing self-assisted and active exercises to patients under their observation.[18]

Physiotherapy in Neurological Conditions:

Neuro-physiotherapists are experienced and trained to treat neurological conditions with the aim to provide interventions which assist an individual to regain or maintain their maximum movement and functional independence. Treatment approaches used by them are spasticity management, stretching, strengthening, balance and gait re-education, coordination training, joint mobilization, electrical stimulation, postural exercise, and advice/education on lifestyle, fatigue management.[21]

Neuro physiotherapists work at various setups like, hospitals/ acute care settings, outpatient clinics and home-based rehabilitation. Patients in hospital settings are more likely to have acute and more extensive injuries making them more dependent than are patients seen in ambulatory settings like outpatient clinics and at home. Stroke, Multiple sclerosis, spinal cord injury, Parkinson's and head injuries are most common neurological conditions which makes patients more dependent especially during acute phase. During physiotherapy treatment of such patient, Neuro-physiotherapists are more likely to perform patient lifts and transfers involving greater physical effort in the hospital environment. The findings from different studies have confirmed that neuro physiotherapists are more prone to develop WMSDs related to low back, upper back, buttocks, thighs and legs.[22,23,24] The reason for development of WMSDs is that the patients with neurological disorders are more dependent and need help with e.g. transfer, lifting and repositioning.

Bork et.al founded that physiotherapist who worked in hospital-based settings had a greater prevalence of WMSDs in the low back, Molumphy et.al also found a high incidence of low back pain among physical therapists in acute care settings. As Physiotherapists are more likely to perform more passive exercises, assisted exercises, various stretching and strengthening exercises, along with these lifts and transfers activities which involves greater physical effort in the hospital environment.[25,26] Other risk factors for development of WMSDs in neuro physiotherapists working in hospital setups are found to be low ratio of physiotherapist and number of patients, repetitive work, awkward posture for long hours, inadequate

breaks, lack of assistance and other administrative loads.

While neuro physiotherapists working in outpatient and home-based rehabilitation, have more chances of developing WMSDs related to neck, upper back and upper limbs followed by low back pain.[6,22] In outpatient clinic and home-based rehabilitation, neuro physiotherapists focus more on giving functional re-education like improvement of posture, balance, co-ordination, gait and activities of daily living in neurological patients. These therapies require high physical demands. Especially gait training has required considerable efforts from the physiotherapist because, beside supporting the balance and posture, the therapist also have to assist the stepping manually.[27]

According to studies neuro physiotherapists should use following strategies to avoid the development of WMSDs at hospital setup. They should use aids and equipment like height-adjustable beds, lifting belts, slide boards, and splints for easy lift and transfer of dependent patient. Also, they can reduce the load by obtaining help when transferring patients by physiotherapy assistant and can shift part of the workload to another therapists.[22]

While strategies to prevent WMSDs in neuro physiotherapist working in outpatient department and home rehabilitation should follow self-protective behaviours like alter the technique or the environment to avoid placing stress on the therapist's body and adjust bed height to prevent injury. Another possible preventive strategy is to use breaks at regular interval and give appointment to less and more dependant patient alternately. Neuro physiotherapist can also use aids and equipment during rehabilitation like lifting belts, slide boards, splints, and stools on casters ("wheelie stools").[22] In neurological patient for gait training at outpatient clinic, neuro physiotherapists are using Bodyweight-supported treadmill training. Despite its many advantages, it remains still exhausting for physiotherapists, due to heavy assisting with lower limbs movements.[28] Neuro physiotherapist can also use assistive robot devices for gait training which can ease or perform tasks that a single physiotherapist cannot do alone. When the patient develops sensory motor control, the robotic devices can reduce the physical effort. As an adjunctive training among the whole neurological rehabilitation, the robots can perform intensive and task-oriented motor training of a patient's extremities, while the therapist is doing the evaluation and supervision.[27]

Physiotherapy in Sports:

Sports Physiotherapists are involved in the prevention and management of injuries resulting from the sport. They also play a huge role in helping athletes of all ages and all levels of ability to enhance their performance. These specialized physiotherapists also provide evidence-based advice on safe participation in sport and exercise.

Sports physiotherapists work in a wide variety of settings like many works in private practice or clinic settings, in social and club level sports and attend training sessions. Along with this Sports physiotherapists often work in the elite athlete setting in competitive and professional sports, working and travelling with elite individual athletes or teams, and integrating their services with other medical professionals, coaches, and other staff. Sports physiotherapists are also actively involved within various sporting organisations to coordinate physiotherapy services, injury prevention, rehabilitation, performance enhancement and injury surveillance programs.[29,30]

The sports physiotherapist's role varies depending on the sport they are involved in, like their specific role within the team, the performance level of the sport, local level or international, amateur or professional etc.[31]

Most common work a sports physiotherapist needs to do in field is to provide first aid, injury evaluation and

physiotherapy treatment which includes techniques like mobilisation, massage, manipulation, acupuncture, taping and exercise prescription. Moreover, they're also involved in administration and athletic education.

Sports physiotherapist often work for elongated and irregular hours or days, doing repetitive movement, bending or twisting body, maintaining a fixed posture for a long time and need to react in emergency situations. These factors not only cause psychological burnout, but they can also lead to physical injuries. Therefore, these professionals are at risk for work-related musculoskeletal disorders (WMSDs). Common conditions occurring as WMSDs in sports physiotherapists are overuse injuries, strain, sprain, tendinitis etc.

A study suggested prevalence of WMSDs in athletic trainer was 48.5% and these disorders are mainly located in low back (42%), finger (38%) and shoulder (26%) regions. According to this study, performing taping was the most significant predictor for the low back and finger symptoms; while performing providing first aid was the most significant predictor for the shoulder's.[32]

As to the affected body regions, higher prevalence of low back pain in sports physiotherapists can be seen because they are involved in frequent lifting and giving manipulations and performing tapping in standing position for long hours. In addition, they have to react to emergency situation frequently. Most taping instructional manuals instruct physiotherapists to position the subjects in appropriate positions before they perform the tasks.[32] However, in a field where equipment and time are limited, physiotherapists need to compromise with the situations making themselves in inappropriate positions while performing time-limited taping techniques.

As taping technique involves repetitive tearing, tensioning and adjustment of the tape by finger movements, so fingers are the second most area affected in sports physiotherapists. In addition, fingers are frequently used for palpating a variety of tissues of various depths during physical examination, as well as for manipulating these tissues during many treatments, leads to development of WMSDs of fingers in sports physiotherapists.[32]

The third most commonly affected body area is shoulder in sports physiotherapist because shoulders provide both the stabilization and movement while performing manual therapy which utilizes skilled, specific hands-on techniques such as palpation, massage, mobilization, stretch to evaluate and treat athlete.

Sports physiotherapists should follow coping strategies such as modify work time/hours, increase rest time or take frequent short breaks, frequent posture change, body mechanics modification, avoid lifting, use of assistive devices, stop working when symptoms rise etc. to prevent WMSDs.

Physiotherapy in Paediatrics:

Paediatric physiotherapists help to achieve optimal physical development in children. Paediatric physiotherapist has knowledge of the movement, development and conditions that are likely to affect the baby and growing child and treat from 1-day-old babies to adolescents. Treatment may involve soft tissue massage, mobilisation, stretching, specific therapeutic exercises and posture education to develop motor skills such as sitting, standing, and walking as well as improvement in flexibility, strength and endurance of a child. While giving rehabilitation to child physiotherapist have to assume various position like kneeling, crossed leg sitting at floor, side sitting near mat, low sitting on stool etc for prolonged period of time. Physiotherapist also needs to lift or hold child in awaked posture leading to more of bending and twisting movement at spine.

The Studies have confirmed work-related musculoskeletal disorders among the paediatric physiotherapist could be high as physiotherapist frequently lift the children and conduct physical actions under inappropriate postures as well as it might have a negative impact on absence-days.[33]

Atia DT et al, reported in their study the Impact of work-related musculoskeletal disorder among paediatric physical therapists in Egypt and found, the most common injured regions were neck (63.2%), shoulder (58.5%), wrist and hand (56.6%), and knee (53.8%) respectively. While elbow, upper back, hips/thighs and ankles were the least complaint region of the participating therapists.[33]

There is higher prevalence of knee symptoms among paediatric physiotherapists due to the large amount of time spent in kneeling and crouching.[4,34] kneeling position gives more pressure on knee joint; it can be avoided by taking frequent breaks and sitting on soft /firm surface like mat and use of knee- pads while working for longer than an hour in a day continuously.[35]

Ergonomic recommendations for minimizing the risks of back injuries in paediatric physiotherapist focus on improving working posture. These include: Alternate between sitting and standing to reduce postural fatigue and maximize postural variety, which helps to reduce static muscle fatigue. When sitting don't lean forwards or stoop in an unsupported posture for prolonged periods. If you are sitting, sit up straight. Avoid having to reach awkwardly to child and work closely. Keep the items used most frequently within a distance of about 20 inches (50 cm). Use assistants or take help from parent to give postural and gait training to child. Keep elbows and upper arms close to the body and don't raise and tense the shoulders when working. Also, ensure that hand postures are not deviated because this could lead to wrist problems.

Physiotherapy in Obstetrics and Gynecology:

Physiotherapy in Obstetrics and gynecology is the care of women in relation to child's birth, both antenatally and postnatally. The role of physiotherapist in obstetrics and gynecology is to take antenatal classes, give treatment for incontinence and pre- and post-operative physiotherapy of women undergoing gynecological surgery.

Occurrence of WMSDs, risk factors and prevention strategies has been studied less in physiotherapist working in this field. Further research is required as now a days demand of physiotherapists in this field have risen tremendously.

Physiotherapy in Rehabilitation:

Rehabilitation focuses on the existing capacities of the handicapped person, and brings him to the optimum level of his or her functional ability by the combined and coordinated use of medical, social, educational and vocational measures. It makes life for the handicapped individual more meaningful, more productive and therefore adds more life to years.

Rehabilitation team includes medical, paramedical, and socio-vocational members. Out of which physiotherapist assists the patient in movement restoration and is a very important member of the rehabilitation team. Physiotherapist has to perform a thorough muscle strength evaluation and quantification, spasticity assessment, and measurement of joint range. On the therapeutic side he would have to perform exercises to maintain and increase joint range of motion, train sitting and standing balance, or increase strength, endurance, and coordination for specific muscle groups or the entire body.[36]

Rehabilitation physiotherapist aims to optimize patients function and well-being to help integrate that patient back in their life style activities whether at home, work or leisure. Rehabilitation can be used for recovery from injury or disease and also for management of long-term conditions for

example Parkinson's, stroke, cancer rehabilitation, cerebral palsy etc.

Most of the physiotherapist according to their specialization also continue long term rehabilitation for their patients. Occurrence of WMSDs, risk factors and prevention strategies may remain same according to their specialization discussed above. Yet it has been studied less in physiotherapist working in long term rehabilitation. Further research is required as now a days reference for physiotherapy for long term treatment have been increased.

CONCLUSION

Physiotherapist are an integral part of health care team, restoring and optimizing movement and function after injury or diseases. There are many physiotherapy specialties including musculoskeletal physiotherapy, pediatrics physiotherapy, neurological physiotherapy, cardio- respiratory physiotherapy, physiotherapy in rehabilitation, sports physiotherapy etc. and each one has its unique purpose and set of responsibilities.

According to area of specialization in physiotherapy, occurrence of WMSDs at different body part may vary. The common affected area in musculoskeletal physiotherapists are low back, neck and thumb as they have to perform more of manual therapy repetitively, maintain static posture for longer duration etc. The neuro physiotherapist has to deal with more dependent patient requiring transfer and lifting activity as well as passive and assisted movement for their ADL, leading to WMSDs affecting low back region. The cardio-respiratory physiotherapist has to perform positioning and chest clearance techniques in standing for longer duration leading to WMSDs at upper back, neck and leg regions. Paediatric physiotherapist often has to perform treatment on mat requiring sitting and kneeling position for longer period, which is responsible for development of WMSDs affecting knee joint. Sports physiotherapists often has to work at field and due to lack of equipment on field physiotherapy need to be given in awkward position leads to development of WMSDs at low back and lower extremity. Occurrence of WMSDs, risk factors and prevention strategies has been studied less in physiotherapy for obstetrics and gynecology and physiotherapy in rehabilitation. Further research is required as now a days demand of physiotherapists in this field have risen tremendously.

Acknowledgement: None

Conflict of Interest: None

Source of Funding: None

REFERENCES

1. World Confederation for Physical Therapy. Description of physical therapy policy statement 2019.
2. World health organization. Classification of heath workforce statistics. April 2010. www.who.int/statistics/workforce_statistics.
3. Bindu PH and Thiruppathi A. Work Related Musculoskeletal Discomfort (Wrmsd) Among Physiotherapists. International Journal of Physiotherapy. 2014 Oct;1(4):200-204. DOI: https://doi.org/10.15621/ijphy/2014/v1i4/54558.
4. Dsouza S, Mathew A, Kumar DKU. Work related musculoskeletal disorders in physiotherapist; prevalence and associated factors: a review of literature. Int J Health Sci Res. 2016;6(6):344-351.
5. Buddhadev NP, Kotecha IS. Work-related musculoskeletal disorders: a survey of physiotherapists in Saurashtra region. National journal of medical research. 2012;2(2):178-181.
6. Nordin NA, Leonard JH, Thye NC. Work-related injuries among physiotherapists in public hospitals: a Southeast Asian picture. Clinics. 2011; 66:373-8.
7. Adegoke BO, Akodu AK, Oyeyemi AL. Work-related musculoskeletal disorders among Nigerian physiotherapists. BMC musculoskeletal disorders. 2008 Dec;9(1):1-9.
8. Ramanandi VH, Desai AR. Association of working hours, job position, and BMI with

work-related musculoskeletal disorders among the physiotherapists of Gujarat—an observational study. Bulletin of Faculty of Physical Therapy. 2021 Dec;26(1):1-6.
9. Ramanandi V, Desai A. Prevalence and Risk Factors of work-related Musculoskeletal Disorders among Indian Physiotherapists: A Narrative Review of Literature. Archives of Occupational Health. 2021 Apr 10;5(2):961-8.
10. Mondal A, Mehedi MMH. Work Related Musculoskeletal Disorders among Physiotherapists in Dhaka City. Bone Muscle. 2019;2:001- 004
11. Anyfantis ID, Biska A. Musculoskeletal disorders among Greek physiotherapists: Traditional and emerging risk factors. Safety and health at work. 2018 Sep 1;9(3):314-8.
12. Rugelj D. Low back pain and other work-related musculoskeletal problems among physiotherapists. Applied ergonomics. 2003 Nov 1;34(6):635-9.
13. Kumar S. Theories of musculoskeletal injury causation. Ergonomics. 2001;44(1):1
14. Cromie JE, Robertson VJ, Best MO. Work-related musculoskeletal disorders in physical therapists: prevalence, severity, risks, and responses. Physical therapy. 2000 Apr 1;80(4):336-51.
15. Milhem M, Kalichman L, Ezra D, Alperovitch-Najenson D. Work-related musculoskeletal disorders among physical therapists: A comprehensive narrative review. International journal of occupational medicine and environmental health. 2016 Jul 4;29(5):735-47.
16. Rossettini, G., Rondoni, A., Schiavetti, I., Tezza, S., & Testa, M. Prevalence and risk factors of thumb pain in Italian manual therapists: An observational cross-sectional study. Work (Reading, Mass.). 2016;54(1):159–169. https://doi.org/10.3233/WOR-162289
17. Hazle, C. R., Jr, & Lee, M. Strategies to overcome size and mechanical disadvantages in manual therapy. The Journal of manual & manipulative therapy.2016;24(3):120–127. https://doi.org/10.1080/10669817.2015.1119371
18. Santos RM, Maduro PA, Silva TF, Trombini-Souza F. Pain and musculoskeletal discomfort in physiotherapists of the intensive care unit and ward of a university hospital: a retrospective cohort study. BrJP. 2018 Apr;1:127-33.
19. Yang S, Li L, Wang L, Zeng J, Li Y. Risk factors for work-related musculoskeletal disorders among intensive care unit nurses in China: A structural equation model approach. Asian nursing research. 2020 Oct 1;14(4):241-8.
20. Karanikas N, Jani BD. Frequency of examination and perceived contribution of factors relating to work-related musculoskeletal disorders of physiotherapists. International Journal of Occupational Safety and Ergonomics. 2021 Jan 19:1-8.
21. Neurological Physiotherapy. Neurological physiotherapy [internet]. 2016. Available from: http://neurologicalphysiotherapy.com
22. Cromie JE, Robertson VJ & Best MO. Work-related musculoskeletal disorders and the culture of physical therapy. Physical therapy.2002;82(5):459–472.
23. Alghadir A, Iqbal Z. Prevalence of work-related musculoskeletal disorders among physical therapists. Medycyna Pracy. 2015;4:459–469 DOI: https://doi.org/10.13075/mp.5893.00142
24. Alghadir A, Zafar H, Iqbal ZA, Al-Eisa E. Work-related low back pain among physical therapists in riyadh, Saudi Arabia. Workplace Health & Safety.2017;8: 337-345 DOI: https://doi.org/10.1177/2165079916670167
25. Bork BE, Cook TM, Rosecrance JC, et al. Work-related musculoskeletal disorders among physical therapists. Phys Ther. 1996;76:827- 835
26. Molumphy M, Unger B, Jensen GM, Lopopolo RB. Incidence of work-related low back pain in physical therapists. P/iy Thm 1985;65: 482-486.
27. Masiero S, Poli P, Rosati G, Zanotto D, Iosa M, Paolucci S & Morone G. The value of robotic systems in stroke rehabilitation. Expert reviews in medical devices. 2014;2:187-198.
28. Mikolajczyk T, Ciobanu I, Badea DI, Iliescu A, Pizzamiglio S, Schauer T, Seel T, Seiciu PL, Turner DL & Berteanu M. Advanced technology for gait rehabilitation: an overview. Advances in Mechanical Engineering. 2018;7:1-19. DOI: 10.1177/1687814018783627

29. Woods A, & Woods CB. An exploration of the perspectives of elite Irish rowers on the role of the sports physiotherapist. Physical therapy in sport: official journal of the Association of Chartered Physiotherapists in Sports Medicine. 2012;13(1):16–21. https://doi.org/10.1016/j.ptsp.2011.02.004
30. Sports and Exercise Physiotherapy New Zealand. What is Sports and Exercise Physiotherapy? [internet] Available from https://sportsphysiotherapy.org.nz/what-is-sports-physiotherapy/
31. Ashton H. Sports physiotherapy advancing in New Zealand. Br J Sports Med. 2015 Jul;49(14):903.
32. Ju YY, Cheng HY K, Hsieh YJ. et al. Work-Related Musculoskeletal Disorders in Athletic Trainer. J Occup Rehabil. 2011;21:190–198. https://doi.org/10.1007/s10926-010-9268-y
33. Atia DT, Abdelazeim FH, Radwan H. Impact of work-related musculoskeletal disorders on Egyptian pediatric physical therapists: one-year follow-up study. Trends in Applied Sciences Research. 2015 Mar 1;10(3):175.
34. Islam M. Common Work-Related Musculoskeletal Disorders Among the Paediatric Physiotherapists at CRP (Doctoral dissertation, Department of Physiotherapy, Bangladesh Health Professions Institute, CRP);Aug 2012
35. Happy SM. Common work-related musculoskeletal disorder among the physiotherapists of neurology unit at CRP (Doctoral dissertation, Bangladesh Health Professions Institute, Faculty of Medicine, the University of Dhaka, Bangladesh.) http://hdl.handle.net/123456789/398 2016-08-16
36. Sunder S. Textbook of rehabilitation. Jaypee Brothers Medical Publishers; 2020.
37. Burns PB, Rohrich RJ, Chung KC. The levels of evidence and their role in evidence-based medicine. Plastic and reconstructive surgery. 2011 Jul;128(1):305.

How to cite this article: Shah MK, Desai RG. Prevalence, risk factors and prevention of work-related musculoskeletal disorders in physiotherapist according to their specialization - a review. *International Journal of Research and Review*. 2022; 9(3): 485-495. DOI: *https://doi.org/10.52403/ijrr.20220354*

******