**ORIGINAL ARTICLE**

# Risk factors of Chronic Wrist Pain among novice Physiotherapists

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## ABSTRACT

**Background:** Estimating the risk factors for chronic wrist pain is one of most extensive research idea with wide application in clinical practice of an orthopedic surgeon and a physiotherapist. Novice physiotherapist need to know accurate knowledge of performing safe techniques and appropriate use of wrist during their clinical practice.
**Aim:** To find out the risk factors of chronic wrist pain among novice physiotherapists of Lahore.
**Methods:** This was a case control study conducted in Lahore, Pakistan in 2019. In this research project 164 subjects participated and they were given a Self-structured questionnaire. The total population questioned was divided into two groups, Group A included cases having wrist pain and Group B included control cases i.e., without wrist pain. Data was collected from novice physiotherapists who fulfill the inclusion criteria. Data was then analyzed using SPSS version 20.0. In analysis odd ratios and relative risk of different variables (risk factors) were calculated.
**Results:** The Odds ratio of repetitive wrist movement, treating >8 patients in a day, repeated excursion of same tasks, previous injury of wrist, not having rest periods during working day, and working in uncomfortable position, were 1 or more, hence proved risk factors for developing chronic wrist pain among novice physiotherapists. On the other hand, odd ratio of mobilization & manipulation, Percussion, shaking & vibration, Orthopedic/Soft tissue mobilization is <1.0 which shows that these are not the factor increasing risk wrist pain.
**Conclusion:** Study results showed that repetitive wrist movement, treating >8 patients a day, repeated excursion of same task, previous injury of wrist, not having rest periods during working hours, and working in uncomfortable position are risk factors for chronic wrist pain among novice physiotherapists
**Keywords:** Risk factors, chronic wrist pain, novice physiotherapist

## INTRODUCTION

Physiotherapists are greatly at risk of developing chronic wrist pain due to physical nature of their work and more commonly among novice physiotherapists. Rarely isolated event or injury lead to these musculoskeletal disorders but they build up gradually as repeated trauma. Major risk factors that cause chronic wrist pain are orthopedic mobilization, manipulation, soft tissue massage and mobilization of joint[1]. Tasks that physiotherapists perform may lead to wrist pain as repetitive movements of upper limb. They are engaged in applying manual therapy, repeatedly performing same tasks, carrying and lifting of dependent or disabled persons these all contribute to develop chronic wrist pain among physiotherapists[2]. Novice physiotherapists are those who have <5 years of experience, having lack of confidence in their field. They are more prone to develop wrist pain and other musculoskeletal disorders while treating patients as compare to experienced physiotherapist[3]. Work natures of physiotherapists are physically demanding. Forceful manual techniques, repetitive movements, maneuver that required direct pressure over many joints. Female physiotherapists are having more wrist pain then male physiotherapists[4]. The unchanged body posture for comprehensive periods of time lead to developing of repetitive injuries because of this the blood supply of tissue are compromised, finally body loses its ability to restore. Symptoms can range mild painful to pointed, crippling pain. Worsening symptoms then impair daily activities and ultimately sleep disturbance occurs due to severe pain[5].

Wrist ache that lasts from 6 weeks to 3months are considered chronic wrist pain. Chronic wrist pain usually impairs performance of physiotherapist working in clinical environment. For diagnosis of chronic wrist pain, complete history and physical examination is required. Finkelstein's test is diagnostic for chronic wrist pain[6]. Wrist pain may impair the functional characters of entire upper extremity. Normal flexion of wrist is 95 degrees, extension is 30 degrees, 10 degrees radial deviation and ulnar deviation is 15 degrees. Intrinsic and extrinsic ligaments of wrist joint provide stability to the wrist, these ligaments become damaged due to overuse of wrist and cause chronic wrist pain[7].

Manual therapy is 3.5 times more likely to develop wrist pain among novice physiotherapists. Older physiotherapist i.e., more than 55 years of age has developed strategies. In these strategies they modify the treatment techniques to reduce the risk of pain in wrist and performing less exhausted or fatiguing treatment techniques, they also take help from assisting staff [8]. One of the Compression neuropathies of upper limb is a carpal tunnel syndrome. Repetitive wrist and hand activity by physiotherapists while treating patients can lead to carpal tunnel syndrome[9].

Received on 24-07-2019
Accepted on 17-02-2020

staffing and heavy load of patients may contribute to the risk factors of wrist injury Studies are conducted on musculoskeletal disorders among physiotherapists but no study was conducted before on risk factors causing wrist pain among novice physiotherapists in Lahore.

The purpose of this study was to evaluate the risk factors of chronic wrist pain among novice physiotherapists of Lahore. The study will give awareness to novice physiotherapists about risk factors that cause wrist pain and affect their work performance as a physiotherapist while treating patients. Avoiding those risk factors novice physiotherapist will improve their performance and health related quality of life.

## MATERIALS AND METHODS

A case control study was designed. Population included in the study were novice physiotherapist from both gender and having more than 5 years of experience The Data was collected from 164 physiotherapist fulfilling inclusion criteria working in different Government & private physical therapy setups in Lahore. The total population questioned was divided into two groups, Group A included cases having wrist pain and Group B included control cases i.e., without wrist pain. Inclusion criterion for the case in this study was novice physiotherapist with h/o wrist pain for more than 6 months. In the Control group population included was physiotherapist without chronic wrist pain. Physiotherapist having some metabolic disorder e.g., osteomalacia and comorbid conditions like hypertension, diabetes, asthma etc. excluded from the study in both groups ongoing pregnancy was also an exclusion criteria. Self structured questionnaire, consisting of close ended questions were derived from previous available literature was used as a tool to assess risk factors of wrist pain. Questionnaire cover 13 questions to evaluate risk factors such as orthopedic mobilization manipulation, number of patients treated a day, soft tissue massage, repetitive movements, vibration, shaking and percussions, previous wrist injury, working in uncomfortable position, repeated excursion of same task. Study was completed in 6 months from 1st January 2019 to 30th June 2019 Convenient sampling technique was used. Demographic details of physiotherapists was collected .Objective of the study was explained to the participants. The inclusion criteria were fulfilled and data was collected after informed consent. Safety of data collected was ensured. And data that was collected, was kept confidential and was only be used for research purpose only. The study was conducted after the approval institutional review board. Statistical data was analyzed by using SPSS version 20. Frequency and percentage was calculated on the base of categorical variables. Odds ratio and relative risk was calculated.

## RESULTS

Out of 164 subjects 82 were cases i.e., pain group (group A) and 82 were controls(group B). In group A, 29 were males and 53 were females. In Group B, 37 were males and 45 were females. The odd ratio of repetitive wrist movement was 1.234(.51-3.040). In cases it shows that it is a risk factor for chronic wrist pain among novice physiotherapists. The odd ratio of treating >8 patients was 1.175(0.618-2.237). In cases it shows that it is a risk factor for chronic wrist pain among novice physiotherapists. The odd ratio of Repeated excursion of same task was 1.000(0.534-1.873). In cases it shows that it is a risk factor for chronic wrist pain among novice physiotherapists The odd ratio of Previous injury of wrist was 1.050(0.568-1.942). In cases it shows that it is a risk factor for chronic wrist pain among novice physiotherapists. The odd ratio of Not having rest periods during working day was 1.050(0.569-1.939). In cases it shows that it is a risk factor for chronic wrist pain among novice physiotherapists. The odd ratio of Working in uncomfortable position was 1.051(0.566-1.954). In cases it shows that it is a risk factor for chronic wrist pain among novice physiotherapists.

The odd ratio of mobilization and manipulation was 0.757(0.268-2.140) which shows that this is not a risk factor among novice physiotherapists for chronic wrist pain. The odd ratio of Percussion, shaking and vibration was 0.798 (0.413-1.543) which shows that this is not a risk factor among novice physiotherapists for chronic wrist pain. The odd ratio of Orthopedic manipulation was 0.820(0.442-1.521) which shows that this is not a risk factor among novice physiotherapists for chronic wrist pain. The odd ratio of Soft tissue mobilization was 0.299(0.092-0.970) which shows that this is not a risk factor among novice physiotherapists for chronic wrist pain.

Table 1: Socio-demographic profile

| Gender | With wrist pain Cases (Pain Gp.) | Without wrist pain Controls | Total |
|---|---|---|---|
| Males | 29 | 37 | 66 |
| Females | 53 | 45 | 98 |
| Total | 82 | 82 | 164 |

## DISCUSSION

The study sought to investigate the risk factors associated with chronic wrist pain among novice physiotherapists of Lahore. Results of study identify that repetitive wrist movement, treating >8 patients a day, repeated excursion of same task, previous wrist injury, not having rest periods during working hours, working in uncomfortable position are risk factors of chronic wrist pain among novice physiotherapists. This is similar to the study conducted by Barnes R who documented that repetitive wrist movement (79%), treating many patients a day (73%) and uncomfortable position (78%) is a risk factor for chronic wrist pain among novice physiotherapists. His study proves that work related wrist pain occurs in first five years after qualifying. His study's result showed that orthopedic manipulation is a major risk factor but my study showed that orthopedic manipulation is not a risk factor for chronic wrist pain among novice physiotherapist[1].

A cross-sectional study was carried out to assess factors such as year of work experience in physiotherapy field, body mass index, gender, and painful clinical area involved. Musculoskeletal disorders were found to be more in female therapists then male therapists and Lifting or carrying and manual techniques being as risk factors[4]. Warren Glover et al established a study to determine work related strain injuries among physiotherapists. Injury usually occurred while treating patients. Work nature of

physiotherapist was repeated tasks and manual handling that lead to musculoskeletal injuries threatening the health of UK physiotherapists. It was concluded that young physiotherapists below age 30 are more prone to develop wrist pain especially first four to five years of their practice .Life time prevalence of work related injuries were as high as 90% among novice physiotherapists[11].

Another study was conducted to evaluate the prevalence of musculoskeletal disorder in physical therapists of Saudi Arabia and Egypt. Causes of painful disorders related to work were assessed. The results showed that one fifth or more Egyptian physiotherapists were hurt while applying manual therapy techniques on patients. Due to stabilizing position for prolong phase of time, injury chances were increased. There were more low back injuries and upper limb pain in Egyptian physiotherapists because of lifting, twisting and bending. Proper body mechanics were needed to improve work performance among Egyptian physiotherapists. Saudi physiotherapists are found to have wrist pain due to their work nature The Saudi physiotherapists reported highest prevalence of low back injury (33%) and neck (29%). Bending and twisting (21%) was the commonest cause that led to injuries among Saudi physiotherapists (PTs). Lifting (21%) was the main cause that led to recurrence of symptoms. 21% of Saudi PTs avoided lifting activities where as 11% changed their work habits with improved body mechanics as a response to musculoskeletal injuries [12].

Byron E Bork concluded in study that joint mobilization and soft tissue mobilization are risk factors in developing wrist pain [13]. Such results not found in our study. Leanne Passier et al in their study identified awkward movements, occupation posture, carrying & lifting and repetitive tasks as risk factors for work related wrist pain among health providers working in demanding clinical settings. They established six factors that can be risk for the professionals working in physically challenging clinical role include organizational strategies, work allocation or work load, work environment, work practice, physical situation, training and learning[14].

Magan E. Fisher conducted a study to examine and determine the mode of physiotherapy service, staffing and load in trauma center. Higher caseload found to be the risk factor for developing disorders among novice physiotherapists. It was concluded that inexperienced physiotherapist were more prone to develop wrist, hand and lumber pain due to increase caseload in trauma center. Treating >8 patients were found to be a risk factor of developing musculoskeletal pain among physiotherapists[15]. This Study result showed that repeated excursion of same task is a risk factor for working as a physiotherapist for wrist pain. Similar results identified in a study by J F Thomsen[16]. His study also indicates that the increasing level of force during treatment is the risk factor for wrist pain too. In this study, lack of rest periods during working hours found casing wrist pain among novice physiotherapist. Dennis Van Roeke revealed that one way to prevent your muscles from getting tired is to rest the muscles doing most of the work. A “micro break”, in which you use different muscles or pause for even a few seconds, can help. This relieves your muscles more effectively than uninterrupted periods of work with only one or two longer rest breaks. So not having rest period is also a risk factor for wrist pain [17]. The results of this Study showed that mobilization and manipulation, percussion, vibrations, orthopedic manipulation and soft tissue mobilization were not a risk factor for chronic wrist pain as they showed odd ratio <1. It could be assumed that it is the physical nature of work that predispose to injury. Experienced Physiotherapist has better knowledge of body mechanics with experience that helps in injury prevention. Treating more patients and working in uncomfortable position is risk factor for chronic wrist pain among novice physiotherapists. Similar study conducted by Madiha Ashfaq concluded that working on large number of patients in a day and in a same position for longer duration are risk factors for wrist pain affecting performance[18]. Our Study results showed that work load of treating many patients a day were considered as a risk factor that lead to wrist pain. So according to study results treating >8 patients a day is a risk factor that cause wrist pain among novice physiotherapists.

## CONCLUSION

Study results showed that repetitive wrist movement, treating >8 patients a day, repeated excursion of same task, previous injury of wrist, not having rest periods during working hours, and working in uncomfortable position are risk factors for chronic wrist pain among novice physiotherapists.

**Limitations:** This Study has analyzed 12 risk factors in novice physiotherapist. Further studies need to be conducted to found more risk factors among novice physiotherapists of Lahore. Results could be more representative for the population if randomized sampling technique was used.

**Recommendations**: There should be breaks during job hours. Novice physiotherapists should work with experienced physiotherapists to learn about proper safe techniques. Physiotherapists should treat less than 8 patients a day

**Declarations:** We acknowledge this study to our parents and teachers. No financial assistance or funds taken in conducting this research. There is neither any conflict of interest nor any ethical issue.

## REFERENCES

1. Barnes R, Colyn HJ, Moolman C, Roux Z, Schabort DJ, Yzel ME. The lifetime prevalence of work-related thumb and wrist pain among physiotherapists in Bloemfontein. Occupational Health South Africa. 2011;17(4):16-22
2. Gharote, Gaurai & Piwal, Priyanka & Yeole, Ujwal & Adakkite, Dr & Gawali, Dr. (2016). Prevalence of common work related musculoskeletal pain in physiotherapy practioners. European journal of pharmaceutical and medical research. 2016;3(5): 398-402.
3. Forbes R, Mandrusiak A, Smith M, Russell T. A comparison of patient education practices and perceptions of novice and experienced physiotherapists in Australian physiotherapy settings. Musculoskeletal science & practice. 2017;28:46-53.
4. Nordin NA, Leonard JH, Thye NC. Work-related injuries among physiotherapists in public hospitals: a Southeast Asian picture. Clinics (Sao Paulo). 2011;66 (3):373–378.
5. LiaoJC, Chong AK, Tan DM. Causes and assessment of subacute and chronic wrist pain. Singapore Medical Journal.2013; 54(10):592-8.
6. Pereira E. Evaluation of the Painful Wrist. In: Wiliam B. Geissler, editor. Wrist and Elbow Arthroscpy. NY: Springer; 2015:29-35.

7. Su-Ya Lee, Hsiao-Feng Chieh, Chien-Ju Lin, I-Ming Jou, Li-Chieh Kuo, Fong-Chin Su. PLoS One. 2016; 11(5): e0155379. Published online 2016 May 12. doi: 10.1371/journal.pone.0155379
8. Silva KKM, Tenório ADS, Guerino MR, et al. Musculoskeletal disorders in manual therapistis. Man. Ther., Posturology Rehabil. Journal.2016,14:428. http://dx.doi.org/10.17784/mtprehabJournal.2016.14.428.
9. Palmer, K.T., Harris, E.C. and Coggon, D. 2007. Carpal tunnel syndrome and its relation to occupation: a systematic literature review. Occupational Medicine. 2007; 57:57- 66.
10. Glover W. Work-related Strain Injuries in Physiotherapists. Physiotherapy. 88(6):364-72.
11. Beynon, C (1999) An investigation of musculoskeletal disorders in healthcare professionals. Doctoral thesis, Liverpool John Moores University. http://researchonline.ljmu.ac.uk/id/eprint/5055
12. Einas Al-Eisa, Syamala Buragadda, Afaf A.M. Shaheen, Amal Ibrahim and Ganeswara Rao Melam. Work Related Musculoskeletal Disorders: Causes, Prevalence and Response Among Egyptian and Saudi Physical Therapist. Middle-East Journal of Scientific Research. 2012; 12 (4): 523-529.
13. Bork, B. E., Cook, T. M., Rosecrance, J. C., Engelhardt, K. A., Thomason, M. E. J., Wauford, I. J., & Worley,R.K. Work-related musculoskeletal disorders among physical therapists. Physical therapy,1996;76(8):827-835.
14. Passier L, mcphail S. Work related musculoskeletal disorders amongst therapists in physically demanding roles: qualitative analysis of risk factors and strategies for prevention. BMC musculoskeletal disorders. 2011;12:24.
15. Fisher ME, Aristone MN, Young KK, Waechter LE, Landry MD, Taylor LA, et al. Physiotherapy Models of Service Delivery, Staffing, and Caseloads: A Profile of Level I Trauma Centres across Canada. Physiotherapy Canada. 2012;64(4):377-85.
16. Thomsen JF, Mikkelsen S, Andersen JH, Fallentin N, Loft IP, Frost P, et al. Risk factors for hand-wrist disorders in repetitive work. Occupational and environmental medicine. 2007;64(8):527-33.
17. Dennis Van Roekel. Repetitive stress injuries Handbook. Educational support Professionals. Published October 2004.
18. Madiha Ashfaq, Saba Kanwal, Anum Tariq. Prevalence of Work-related Musculoskeletal Disorders among Physical Therapists working in Rawalpindi/Islamabad. JRCRS. 2013; 1(2): 6-11.


Table 2: Odd ratio & P value

| Variable | | With wrist pain cases=82 | Without wrist pain control=82 | Total | OR(90%CI) | p-value |
|---|---|---|---|---|---|---|
| Repetitive wrist | Yes | 72 | 70 | 142 | 1.234(.51-3.040) | 0.410 |
| | No | 10 | 12 | 22 | | |
| Total | | 82 | 82 | 164 | | |
| Mobilization and manipulation | Yes | 73 | 75 | 148 | .757(.268-2.140) | 0.397 |
| | No | 09 | 07 | 16 | | |
| Total | | 82 | 82 | 164 | | |
| Treating >8 patients a day | Yes | 55 | 52 | 107 | 1.175(.618-2.237) | 0.372 |
| | No | 27 | 30 | 57 | | |
| Total | | 82 | 82 | 164 | | |
| Percussion ,shaking and vibration | Yes | 54 | 58 | 112 | .798(.413-1.543) | 0.307 |
| | No | 28 | 24 | 52 | | |
| Total | | 82 | 82 | 164 | | |
| Orthopedic manipulation | Yes | 44 | 48 | 92 | .820(.442-1.521) | 0.319 |
| | No | 38 | 34 | 72 | | |
| Total | | 82 | 82 | 164 | | |
| Soft tissue mobilization | Yes | 70 | 78 | 148 | .299(.092-.970) | 0.031 |
| | No | 12 | 04 | 16 | | |
| Total | | 82 | 82 | 164 | | |
| Previous injury of wrist | Yes | 38 | 37 | 75 | 1.050(.568-1.942) | 0.500 |
| | No | 44 | 45 | 89 | | |
| Total | | 82 | 82 | 164 | | |
| Repeated excursion of same task | Yes | 50 | 50 | 100 | 1.000(.534-1.873) | 0.564 |
| | No | 32 | 32 | 64 | | |
| Total | | 82 | 82 | 164 | | |
| Not having rest periods during working day | Yes | 44 | 43 | 87 | 1.050(.569-1.939) | 0.500 |
| | No | 38 | 39 | 77 | | |
| Total | | 82 | 82 | 164 | | |
| Working in uncomfortable position | Yes | 35 | 34 | 69 | 1.051(.566-1.954) | 0.500 |
| | No | 47 | 48 | 95 | | |
| Total | | 82 | 82 | 164 | | |
| * p-value significant at or less than 0.05 | | | | | | |