

Injury prevention in physiotherapists - a scientific review

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Abstract: This review targeted all research previously conducted on the topic of musculoskeletal disorders and injury among physiotherapists, with a particular focus on studies that had examined individual, physical and psychosocial risk factors and provided suggestions or recommendations to prevent such injuries. Scientific literature published in English languages was searched using electronic way. A total of 17 appropriate studies were located and examined, most of which had focused on the prevalence of musculoskeletal disorders/pan or any other injury. From the review, it was shown that major risk factors among the physiotherapist were manual therapy, repetitive movement, awkward and static posture, physical load, lifting and transferring, treating large number of patients treating in a single day, working while injured, years of experience. The preventive measures that described in these literatures were awareness of reporting of injury, use of less manual therapy, proper exercise, formulation of new devices, intervention at the level of workplace, work schedule allocation, proper training, ongoing risk assessment and control.

Keywords: "Work related musculoskeletal disorders" "prevention mechanism" "Ergonomics"

1. Introduction

Musculoskeletal disorders (MSDs) affect the body's muscles, joints, tendons, ligaments and nerves. The term musculoskeletal disorder identifies a large group of conditions that result from traumatizing the body in either a minute or major way over a period of time. Most work-related MSDs develop over time and are caused either by the work itself or by the employees' working environment. Physical therapists are often at high risk of developing WMSDs as they are mostly involved in physically demanding and intense, repetitive tasks in their practices [3,7]. The major body part that is affected among the physiotherapist is lower back region [4,9,11,16,17,21,22]. More female therapists report spinal symptoms and WRMSDs than male therapists [7,18]. A study demonstrated high lifetime prevalence (70%) of lower back pain among physical therapists due to improper body mechanics and faulty technique during the daily activities of patient

handling [22]. Physiotherapists with BMI > 25 were more likely to report WRMSDs than those with BMI of 18-25 [18]. Musculoskeletal outpatients (31%), neurological rehabilitation (14%) and elderly care (12%) were the three major clinical areas producing serious WRMSD among therapists [9]. The therapists who worked in general medicine, paediatrics, elderly care, psychiatry and outpatient burns had a 46% greater likelihood of getting WRMSD during the course of their work [24,9]. Paediatric rehabilitation had highest prevalence of MSD of upper back [3]. In another study it was reported a high prevalence of life time low back pain among the health care workers, cause was reported as daily lifts and transfers performed by the health care professionals [12]. More than 60% of physiotherapists experience work-related pain and discomfort throughout the world. The prevalence is higher (approximately 80%) among physical therapists below the age of 35. High prevalence of pain and disorder in the physiotherapists has forced them to reconsider their

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career and leave their current job sometime. Musculoskeletal injuries to the low back and other areas of the spine are the most prevalent followed by disorders of upper limb such as shoulder, neck, wrists and fingers. Due to an increased impact of low back injury on the career of physiotherapists, most of the prior research is in the area of identifying risk factors and recommending prevention strategies to reduce back pain. In order to design prevention strategies for physiotherapists, it is important to take an account of the risk factors that may be associated with the development and exacerbation of WRMSD in physiotherapists.

Several epidemiological studies have identified risk factors that may aggravate musculoskeletal pain in physiotherapist and expose them to both acute and cumulative WRMSDs. The major occupational factors for the development of musculoskeletal disorders are force, repetition, static and awkward posture, vibration, long duration of work. Among all these factors while doing manual handling of the patients' physiotherapist exposed themselves to heavy lifting, bending, and twisting, long working hours, applying force, maintaining awkward posture for long hours etc. All these factors are responsible for the development of musculoskeletal disorders over the period of time. Additionally, most of the therapists tend to self-treat or ask a colleague to treat their symptoms and not take enough rest for recovery. Injured physiotherapists use coping strategies such as modify their treatment techniques and work environment or change the type of patients that they were treating. This is also one of the major reasons for less reporting of symptoms by the physiotherapists. Ignoring the symptoms and not taking break or seek proper medical advice will lead

to further aggravation of the condition. In addition, literature suggests that the onset of WRMSD tend to occur early (i.e. 0-5 yrs.) in a physiotherapist's career. New physiotherapists are involved in the rotation of clinical postings in various specialties that may also expose them to a higher risk of injuries during their work. Therefore, controlling the symptoms in the initial years of working through proper training and treatment may be able to prevent potentially disabling conditions. Keeping all above in mind this paper tried to review all the preventive measures available in literature.

2. Methodology

All the study published in peer reviewed journal describing the prevention strategy of workrelated musculoskeletal disorders among the physiotherapist were included in this review article. Inclusion criteria was, the paper should conclude the article giving the recommendation for the physiotherapist regarding 'how to prevent or minimize or reduce the risk factors of workrelated musculoskeletal disorders among physiotherapist or occupational therapist?'. The scientific literature published during 1996 to 2011 were searched for prevention strategy of workrelated musculoskeletal disorders among physiotherapist, collected and thoroughly read. The search was performed by PubMed (National Library of Medicine) using the key words like 'Work related MSD', 'physiotherapist', 'low back pain', 'prevention strategy', 'recommendation', 'back injury', 'neck pain', 'shoulder pain', The recommendation for prevention strategies were segregated and analyzed.

3. Result

Table 1.
TReview of WRMSD among physiotherapists

Reference	Sample Size	Method	Risk factor investigated	Recommended prevention strategy
Darragh et al, 2009	3,297	Questionnaire	<ul style="list-style-type: none"> - Gender - Weight - Age - Years of experience - Hours worked per week - Patient contact hours per week 	<ul style="list-style-type: none"> - Make a shift away from their reliance on body mechanics alone as a protection against injury - Examine the integration of safe patient handling and movement devices and recommendations into therapy
Passier et al, 2011	66 Physiotherapist 46 Occupational therapist	Questionnaire	<ul style="list-style-type: none"> - Work postures and movements - Lifting or carrying - Repetitive tasks 	<ul style="list-style-type: none"> - Intervention at the level of - Organizational strategies - Workload or work allocation - Work practices

				<ul style="list-style-type: none"> - Work environment and equipment - Physical conditional and capacity - Education and training
West et al, 2001	Male – 39 Female – 178	Questionnaire	<ul style="list-style-type: none"> - Static postures - Repetitive actions - Treating excessive number of patients - Working while injured - Performing manual therapy techniques 	<ul style="list-style-type: none"> - reporting of injuries by physiotherapists themselves
Salik et al, 2004	Male – 28 Female – 92	Questionnaire	<ul style="list-style-type: none"> - Lifting - Maintaining a position for prolonged period of time - Performing repetitive tasks - Transferring patients - Intrinsic factors - Technical factors - Environmental factors 	<ul style="list-style-type: none"> - Correcting body mechanics - Avoided lifting heavy equipment or patients - Changed position frequently - Get other personnel to help them with tasks that involved lifting - Proper Exercise - Devise formulation
Nordin et al, 2011	81	Questionnaire	<ul style="list-style-type: none"> - Mobilizations - Manipulations and massaging - Lifting or transferring activities 	<ul style="list-style-type: none"> - Appropriate management strategies
Adegoke et al, 2008	126	Questionnaire	<ul style="list-style-type: none"> - Treating large number of patients in a day - Static posture - Lifting/transferring manual orthopedic techniques - Bending or twisting - Not having enough rest break during the day - Repetition - Working at or near your physical limits 	<ul style="list-style-type: none"> - Selected treatment - Shorter physiotherapy career
Cromie et al, 2002	824	Questionnaire	<ul style="list-style-type: none"> - Electro physical agents 	<ul style="list-style-type: none"> - Appropriate guidelines for hydrotherapy
Cromie et al, 2001	NA	Survey	<ul style="list-style-type: none"> - Postural - Environmental 	<ul style="list-style-type: none"> - Familiarization with the requirements of the legislation governing occupational health and safety - Self evaluation of workplace risk factors - Ergonomic guidelines for space, equipment, furniture and environmental conditions - Work schedule to ensure variety in the physical demands of work - Mechanical aids and equipment should be used - Training - Ongoing risk assessment and control
Bork et al, 1996	1160	Questionnaire	<ul style="list-style-type: none"> - Manual Therapy - Repetitive movement - Awkward postures - High force levels 	<ul style="list-style-type: none"> - Suggestion to develop preventive measures
McMahon et al, 2006	961	Questionnaire	<ul style="list-style-type: none"> - Hyper mobility of thumb joint - Repeated weight transmission 	<ul style="list-style-type: none"> - Potential risk factors need to address in the undergraduate and workplace setting - Modify the work practice

Glove et al, 2002	NA	Review	– Lifting or transferring patients – Younger age	– Proper work break – Sufficient staff – Consult proper medication
Glover et al, 2005	3661	Questionnaire	– Young age – Repetition – Static posture – Large number of patient in a day	– Reporting of workplace injury – Proper consultation to doctor
Wajon et al, 2007	129	Questionnaire	– Alignment of thumb	– Safe performance of mobilization technique
Alrowayeh et al, 2010	222	Questionnaire	– Gender – Physical load – Psychosocial load – General health status	– WRMSD education – WRMSD Prevention program.

3.1. Prevention strategy

A total 17 studies were identified. The size of the study population ranges considerably between the studies. In some study the sample size was 3661, in some cases it is 81. A study reported a high incidence and prevalence rate of work related injury at the workplace of physiotherapist [8]. The type of injury or discomfort or pain reported in these studies were low back pain, shoulder pain, neck pain, upper back, hand/wrist, thumb, ankle feet, knee. In most of the cases reported in the literature the physiotherapists are reluctant to report any musculoskeletal problems or injury. The injury or pain or discomforts occur during their working schedule but they overlook the issue in most of the cases. Many a times it had been reported that they are taking self treatment of treating themselves with the help of their colleague. It has been reported that every one person among six physiotherapist change the carrier profile due to workplace injury of MSD problems. Many cases it has been reported that the physiotherapist finding difficulties in working in any particular position change their way of treatment or change the type of patients. Among all the risk factors described in literature manual therapy, repetitive movement, awkward and static posture, physical load, lifting and transferring, treating large number of patients treating in a single day, working while injured, years of experience etc.

Currently there are less set of prevention strategies that are directed towards physiotherapists but some recommendations have been made in recent research studies. More emphasis needs to be placed on physiotherapists to report their musculoskeletal injuries. This may also be controlled by having a better injury surveillance system in place by the employers. It is important to adopt prevention strategies by the individuals (i.e. physiotherapists) and also by the profession. Additionally, seeking

Proper medical care and physiotherapy is often more effective if started early on during the onset of symptoms. Using various tools for pressure application rather than manually may help in reducing the symptoms. Incorporating breaks and stretching in between work is essential to reduce exposure to muscle injury. Although implicated, more research and studies are needed to clearly understand the causes and prevention of symptoms and injuries in physiotherapists. The tutorial will be designed to discuss the prevalence, risk factors and the existing and promising injury prevention methods to reduce the burden of WRMSD in physiotherapists. Case studies, based on our experience at a tertiary level rehabilitation centre at Bangalore, India, employing over 80 physiotherapists, would be presented.

4. Discussion and conclusion

This paper presents a systemic review of those papers, published in English language, and previously investigated the prevalence of injury and musculoskeletal discomfort and the prevention strategy formulated to minimize or reduce the injury or discomfort among the physiotherapist. Overall this review suggests that the physiotherapist who treat patients and give physiotherapy for curing different musculoskeletal problems / disorders, are themselves prone to develop different musculoskeletal disorders and injuries. Among all the prevention strategy the most recommended strategy was proper reporting of MSD and ongoing ergonomics evaluation/ awareness/ training among the physiotherapists. Although any absolutely mechanism to prevent workplace injury among physiotherapist were not established yet. Further most of the study carried out in other part of the world not in India. Thus there is a

need felt to study the prevalence of MSD & other injury and prevention strategy adopted by the physiotherapist in India.

Reference

- [1] Adegoke B.O., Akodu A.K., Oyeyemi A.L., Work-related musculoskeletal disorders among Nigerian Physiotherapists, *BMC Musculoskelet Disord*, 2008, 9, 112 – 120.
- [2] Alrowayeh H.N., Alshatti T.A., Aljadi S.H., Fares M., Alshamir M.M. and Alwazan S.S., Prevalence, characteristics, and impacts of work-related musculoskeletal disorders: a survey among physical therapists in the State of Kuwait, *BMC Musculoskeletal Disorders*, 2010, 11, 11.
- [3] Bork B.E., Cook T.M., Rosecrance J.C., Engelhardt K.A., Work-related musculoskeletal disorders among physical therapists, *Phys Therapy*, 1996, 76, 827 – 835.
- [4] Campo M., Weiser S., Koenig K.L., Nordin M., work-related musculoskeletal disorders in physical therapists: A prospective cohort study with 1-year follow-up, *Phys Ther*, 2008, 88, 608 – 619.
- [5] Cromie J.E., Robertson V.J. and Best M.O., Occupational health in physiotherapy: General health and reproductive outcomes, *Australian Journal of Physiotherapy*, 2002, 48, 287 – 294.
- [6] Cromie J.E., Robertson V.J. and Best M.O., Occupational health and safety in physiotherapy: Guidelines for practice, *Australian Journal of Physiotherapy*, 2001, 47, 43 – 51.
- [7] Cromie J.E., Robertson V.J., Best M.O., Best M.O., Work-related musculoskeletal disorders in physical therapists: prevalence severity, risks and responses. *Phys Therapy*, 2000, 80, 335 – 336.
- [8] Darragh A.R., Huddleston W., King P., Work-Related Musculoskeletal Injuries and Disorders Among Occupational and Physical Therapists, *The American Journal of Occupational Therapy*, 2009, 63, 351 – 362.
- [9] Glover W., McGregor A., Sullivan C., Hague J., Work-related musculoskeletal disorders affecting members of the Chartered Society of Physiotherapy, *Physiotherapy*, 2005, 91, 138 – 147.
- [10] Glove W., Work-related Strain Injuries in Physiotherapists: Prevalence and prevention of musculoskeletal disorders, *Physiotherapy*, 2002, 88, 364 – 372.
- [11] Holder N.L., Clark H.A., DiBlasio J.M., Hughes C.L., Scherpf J.W., Harding L., Shepard K.F., Cause prevalence, and response to occupational musculoskeletal injuries reported by physical therapists and physical therapist assistants, *Phys Ther*, 1999, 79, 642 – 652.
- [12] Landry M.D., Raman S.R., Sulway C., Golightly Y.M., Hamdan E., Prvalance and risk factors associated with low back pain among health care providers in a Kuwait hospital, *Spine*, 2008, 33, 539 – 545.
- [13] Larsen A.I., Congenital malformations and exposure to high-frequency electromagnetic radiation among Danish physiotherapists, *Scand J Work Environ Health*, 1991, 17, 318 – 323.
- [14] Lerman Y., Jacobovich R. and Green M.S., Pregnancy Outcome Following Exposure to Shortwaves Among Female Physiotherapists in Israel, *American Journal of Industrial Medicine*, 2001, 39, 499 – 504.
- [15] McMahon M., Stiller K. and Trott P., The prevalence of thumb problems in Australian physiotherapists is high: an observational study, *Australian Journal of Physiotherapy*, 2006, 52, 287 – 292.
- [16] Mierzejewski M., Kumar S., Prevalence of low back pain among physical therapists in Edmonton Canada. *Canada Disabil Rehabil*, 1997, 19, 309 – 317.
- [17] Molumphy M., Unger B., Jenson G.M., Lopopolo R.B., Incidence of workrelated low back pain in physical therapists, *Phys Ther*, 1985, 65, 482 – 486.
- [18] Nordin N.A.M., Leonard J.H., Thye Ng C., Work-related injuries among physiotherapists in public hospitals—a Southeast Asian picture, *Clinical Science*, 2011, 66, 373 – 378.
- [19] 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.
- [20] Ouellet-Hellstrom R., Stewart W.F., Miscarriages among female physical therapists who report using radio- and microwave-frequency electromagnetic radiation, *Am J Epidemiology*, 1993, 138, 775 – 786.
- [21] Salik Y., Özcan A., Work-related musculoskeletal disorders: a survey of physical therapists in Izmir-Turkey, *BMC Musculoskeletal Disor*, 2004, 5, 27.
- [22] Shehab D., Aljarallh K., Moussa M., Adham N., Prevalence of low back pain among physical therapists in Kuwait, *Med Princ Pract*, 2003, 12, 224 – 230.
- [23] Wajona A., Ada L. and Refshauge K., Work-related thumb pain in physiotherapists is associated with thumb alignment during performance of PA pressures, *Manual Therapy*, 2007, 12, 12 – 16.
- [24] West D.J. and Gardner D., Occupational injuries of physiotherapists in North and Central Queensland, *Australian Journal of Physiotherapy*, 2001, 47, 179 – 186.