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 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 lifetime 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
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’, ‘neck pain’, ‘shoulder pain’. The recommendation for prevention strategies were segregated and analyzed.

3. Result

<table>
<thead>
<tr>
<th>Reference</th>
<th>Sample Size</th>
<th>Method</th>
<th>Risk factor investigated</th>
<th>Recommended prevention strategy</th>
</tr>
</thead>
</table>
| Darragh et al, 2009     | 3,297       | Questionnaire| – Gender  
– Weight  
– Age  
– Years of experience  
– Hours worked per week  
– Patient contact hours per week | – 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 | – Work postures and movements  
– Lifting or carrying  
– Repetitive tasks | Intervention at the level of  
– Organizational strategies  
– Workload or work allocation  
– Work practices |
### Work environment and equipment
- Physical conditional and capacity
- Education and training
- Reporting of injuries by physiotherapists themselves

### West et al, 2001
- Male – 39
- Female – 178
- Questionnaire
- Static postures
- Repetitive actions
- Treating excessive number of patients
- Working while injured
- Performing manual therapy techniques

### Salik et al, 2004
- Male – 28
- Female – 92
- Questionnaire
- Lifting
- Maintaining a position for prolonged period of time
- Performing repetitive tasks
- Transferring patients

### Nordin et al, 2011
- 81
- Questionnaire
- Mobilizations
- Manipulations and massaging
- Lifting or transferring activities

### Adegoke et al, 2008
- 126
- Questionnaire
- 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

### Cromie et al, 2002
- 824
- Questionnaire
- Electo physical agents
- Selecting treatment
- Shorter physiotherapy career

### Cromie et al, 2001
- NA
- Survey
- Postural
- Environmental
- 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
- Manual Therapy
- Repetitive movement
- Awkward postures
- High force levels
- Suggestion to develop preventive measures

### McMahon et al, 2006
- 961
- Questionnaire
- Hyper mobility of thumb joint
- Repeated weight transmission
- Potential risk factors need to address in the undergraduate and workplace setting
- Modify the work practice
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.

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample Size</th>
<th>Study Type</th>
<th>Risk Factors</th>
<th>Prevention Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glove et al, 2002</td>
<td>NA</td>
<td>Review</td>
<td>- Lifting or transferring patients</td>
<td>- Proper work break</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Younger age</td>
<td>- Sufficient staff</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Proper work break</td>
<td>- Consult proper medication</td>
</tr>
<tr>
<td>Glover et al, 2005</td>
<td>3661</td>
<td>Questionnaire</td>
<td>- Young age</td>
<td>- Reporting of workplace injury</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Repetition</td>
<td>- Proper consultation to doctor</td>
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<td></td>
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<td>- Static posture</td>
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<td>- Large number of patient in a day</td>
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<tr>
<td>Wajon et al, 2007</td>
<td>129</td>
<td>Questionnaire</td>
<td>- Alignment of thumb</td>
<td>- Safe performance of mobilization technique</td>
</tr>
<tr>
<td>Alrowayeh et al, 2010</td>
<td>222</td>
<td>Questionnaire</td>
<td>- Gender</td>
<td>- WRMSD education</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Physical load</td>
<td>- WRMSD Prevention program.</td>
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<td></td>
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<td>- Psychosocial load</td>
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<td></td>
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<td>- General health status</td>
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</tr>
</tbody>
</table>

3.1. Prevention strategy

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