



Impact of Health Education Program on Musculo Skeletal Problems among School Teachers in Rural Areas

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ABSTRACT

Aims: Work Related Musculoskeletal Disorders (WRMSDs) are becoming serious health problems with prevalence in school teachers higher from rural areas. It affects the functional capacity and productivity at work leading to more absenteeism, sick leaves and early retirement. Rural teachers have less resources to overcome these problems and reduce WRMSDs. Hence the aims of this study were 1) to assess WRMSDs rate 2) to assess knowledge and attitude regarding WRMSD 3) to study the impact of health education program among this target group.

Method and Materials: In this experimental study, 62 teachers participated. Pre validated questionnaire regarding knowledge and attitude about WRMSDs was administered. The rate of WRMSDs was assessed and then the session on health education related to same was given to them through online manner once/week and asked them to follow instruction for the entire week. Knowledge, attitude and pain were assessed pre and post health education training and follow up was taken after 4 weeks of training sessions completion.

Findings: The rate of WRMSDs among rural school teachers was 64.52% (95% CI = %51.34 – %76.26). Low Back Pain (LBP) and all body pain was found in the majority of the teachers followed by knee and neck pain. After 4 weeks, pain intensity was significantly reduced from 64.5% (CI - 51% to 76%) to 51.6% after 4 weeks of intervention. It was further reduced to 33.9 % in the follow-up period. Score for knowledge and attitude was also improved significantly after 4 weeks but attitude changed after one month follow-up.

Conclusion: This study showed that health education and ergonomic interventional program could reduce pain, improve knowledge and change attitude of school teachers in rural areas. Whereas long duration programs with frequent feedbacks are needed to change attitude in long term.

Keywords: Musculoskeletal Disorders, School Teachers, Rural Area, Health Education.

Introduction

In developing countries musculoskeletal disorders are the most common occupational health problem^[1]. Work related musculoskeletal problems are becoming major health issues with mechanized production^[2]. There is a linear correlation between Work Related Musculoskeletal Disorders (WRMSDs) and age and duration of services. Nowadays in industrialized countries along with mental health problems, WRMSD are becoming serious health problems^[3]. Because of the different types, forms and work related tasks there are different types of the musculoskeletal disorders^[4,5,6]

WRMSD become more common in the educational field due to large exposure to risk factors and the prevalence is found from 45 to 91%^[1]. It also affects the functional capacity and productivity at work, often leading to more absenteeism, sick leaves and also early retirement of teachers which may affect the students' performances⁷. Working on desk frequently, prolonged standing, repetitive overhead activities specially while using black board, continuous reading, preparing lessons, use of computer increases musculoskeletal load and leads to pain in back, neck, shoulder etc.^[1,6,8]

In order to reduce the risk of

musculoskeletal injury, health education and ergonomic training play the important role of early intervention^[9]. According to Santos et al., special educational program about WRMSD ergonomic strategies helps to improve quality of life and reduces the risk of injuries at work place^[10]. Muscle and joints related pain is an indicator of injury and damage to underlying tissues. Pain results from lifting heavy loads and working in same posture increases anxiety level, low willingness to work which ultimately affect mental health. Therefore there is need to study relation of pain, and disturbance in work due to symptoms. There are so many provoking factors for musculoskeletal pain like smoking; obesity, improper posture together affects work satisfaction and also affects income and productivity of work. Their problems have to be managed otherwise it may lead to large impairment, absenteeism and available treatments becomes costly^[11, 12].

Self management model has particular features and focuses on important elements like building of self efficacy, self-monitoring, setting goals and plan of action, making decisions, solving problems, self-tailoring and correlation between the opinions of patients and health professionals.^[13]

According to Lorig and Holman, a self-management program has to be based on community and should be acceptable and accessible by all community members^[14].

Self management programs are different from traditional method because of some unique features. New self management programs are established for management of chronic musculoskeletal conditions^[15]. Many clinical trials have been conducted and their findings are not similar to each other. Few recent reviews have been published to clarify this issue which focuses mainly on arthritis associated pain and disability^[16,17,18,19]. In fact it has been proven

that non pharmacological management has long term effects and there are no limitations^[20].

Indian rural health care systems face more crises than any other sectors. Almost 86% area of India is rural, still travelling to more than 100 km to avail of health care facility out of which 70.80% are facing poverty issues.^[21] The government is working on developing infrastructures in urban area and working hard to execute this in rural areas, due to the large population. As primary health care centers and community health care centers are located far from rural areas with restriction in transport facilities, people have to travel by their own and it may result in daily loss of wages. This can't be afforded to rural people so they have to approach private health care practitioners, usually unregistered and their fees are very high.

Despite all there is lack of literature available about musculoskeletal problems faced by teaching professionals particularly in rural areas, people are reluctant towards their health and put it secondary to their other preferences hence this study aims to assess the prevalence of musculoskeletal pain in school teachers of rural areas, develop the self management behavioral strategies to cope up with their pain, give proper knowledge and make them aware about WRMSD and workplace interventions as early treatment prevention^[21].

Method and Materials

This experimental study was conducted on 62 school teachers from rural areas in and around Pune. Inclusion criteria were schools teachers who were teaching for more than 12 months, willing to participate, age from 18 to 58 years. Participants who were having systemic disorders, congenital disorders, recent injuries, recent fractures were excluded

Approval was taken from Institutional

Ethical Committee (reference no. DYCPT/IEC11/2020) of Dr. D. Y. Patil College of Physiotherapy, Pune and Clinical Trial was registered (CTRI/2020/11/029015) and then samples were recruited for the study. Written Informed Consent was taken from all participants.

Google form was made for the assessment of baseline demographic data and it was circulated to all the participants. Current physical symptoms were collected by giving pre validated questionnaire. This questionnaire was further divided into 3 parts pain, knowledge and attitude. Part A had 5 questions regarding pain, Part B had 9 questions related to attitude and Part C had 11 questions were related to knowledge part. If they answers 'Yes' then one mark and for 'no', zero marks was allotted This questionnaire was validated by experts in different fields including orthopedic surgeon, musculoskeletal physiotherapy clinicians and academicians from community physiotherapy department. It was constructed in English and then it was translated into Marathi which was further retranslated into English. Content validation was done There were 4 weeks of intervention given to all participants via Zoom Meeting Cloud using a series of occupational health education lectures and ergonomic training. For better personal attention participants were divided into the batches of 8 participants.

After 4 weeks, data were collected as a post intervention parameters. Designed educational intervention was implemented for 4 educational sessions. E-learning was used in present study as it is new educational method in promoting health and it was easy for rural teachers to get connected and practice exercises after teaching hours. The training program was based on behavioral change strategies. Every session was conducted for 45 min and after each session

content and material was shared online with participants.

Week 1: Information about work related musculoskeletal disorders and signs and symptoms plus exercise protocol which was divided into 3 intervals including basic posture correction exercise, mobility, and stretches.

Week 2: Information about ergonomic and workplace modifications plus exercises.

Week 3: Progression of exercise by using sandbags, participants were taught about procedure of making sandbags.

Week 4: Revision and doubt solving

The questionnaire was given to participants immediately post intervention and they were asked to continue exercises and again 1 month follow up was taken.

Statistical analysis: Data was analyzed by using medical application. As data was not normally distributed Friedman test and Wilcoxon test were used to compare between pre and post data and also follow up data and confidence interval was kept at 95%.

Findings

In the pre test stage, before educational intervention, all the data of 62 participants were recorded and considered. After the educational intervention post test and follow up data were recorded and considered too.

Table 1) Age distribution among studied participants

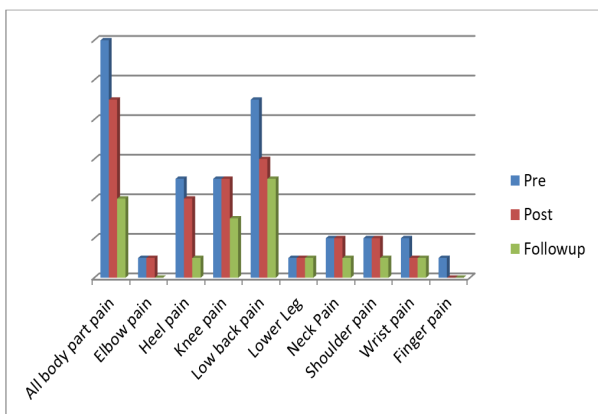
| Age group distribution | Samples N(%) | Male N(%) | Female N(%) |
|------------------------|--------------|-----------|-------------|
| 30-40 | 14(22.9) | 11(17.7) | 3(4.8) |
| 40-50 | 33(53.2) | 16 (25.8) | 17(27.4) |
| 50-60 | 15 (24.2) | 7 (11.3) | 8(12.9) |
| Total | 62 (100) | 34(54.8) | 28 (45.2) |

54.8% participants were males and 45.2% were females in the study.

Table 2) Musculoskeletal pain among rural school teachers

| Musculoskeletal pain | Pre Intervention N(%) | Post Intervention N(%) | Follow up N(%) |
|----------------------|-----------------------|------------------------|----------------|
| With pain | 40 (64.5) | 32(51.6) | 21(33.9) |
| Without pain | 22 (35.5) | 30 (48.4) | 41(66.13) |

The rate of musculoskeletal pain was 64.5% (CI - 51% to 76%) which was reduced to 51.6% after 4 weeks of intervention. It was further reduced to 33.9 % in the follow-up period.



Graph 1) No. of Teachers having pain at various sites during Pre intervention, Post intervention and 4 weeks follow-up

Most common site of pain among teachers is overall body pain (19%) and low back pain (15%) followed by knee pain and Heel Pain (8%). Friedman Test was used for pre, post and follow up pain intensity. This was significantly reduced ($p < 0.001$). For multiple comparisons - Holm Adjusted Wilcoxon signed rank tests was used and p value was significant while comparing pre pain to post pain and pre pain to follow up pain.

Friedman Test was used pre post and follow up pain intensity was significantly reduced ($p < 0.001$). For multiple comparisons - Holm Adjusted Wilcoxon signed rank tests was used and p- value was significant while comparing pre pain to post pain and pre pain to follow up pain

Table 4) Knowledge and attitude of school teachers about their health

| Studied variable | (Mean +SD) |
|-------------------|-----------------|
| Knowledge | |
| Pre Intervention | 5.51 +1.29 |
| Post Intervention | 8.32 +1.31 |
| Follow Up | 9.25+1.67 |
| Attitude | Mean +SD |
| Pre Intervention | 3.52 +1.29 |
| Post Intervention | 6.45+1.33 |
| Follow Up | 5.88+1.31 |

Friedman Test was used to interpret knowledge among rural teachers which was significantly improved ($p < 0.001$). By using Holm Adjusted Wilcoxon signed rank tests pre post and follow up knowledge was compared and there was significant difference in pre post and follow up knowledge was observed as ($p < 0.001$). Friedman Test was used to compare and the attitude was significantly altered after ergonomic advice and exercise session ($p < 0.001$). For Multiple Comparisons, Holm Adjusted Wilcoxon signed rank test was used to comparing pre post and post follow up attitude, we can interpret that the attitude was significantly improved but it was not retained till follow up.

Discussion

This study was designed to check the impact of health education program on musculoskeletal problems among school teachers of rural areas. The study aimed to report the prevalence and compare the knowledge, attitude and pain component

before and after intervention. Furthermore, to understand its impact after 4 weeks post intervention using self administered validated questionnaire.

Four weeks of health education and ergonomic advice were given to all participants and questionnaire was given to participants' pre intervention, post intervention (at the end of 4 weeks) and follow up (at the end of 8th week). This study has reported that there was significant improvement observed in pain and knowledge. As there was no significant difference observed in attitude in pre and follow up period which shows that the long term training and feedbacks are required for changes in attitude. Total 62 participants participated in the study out of which 54% were females and 43% were males.

There is high prevalence (64%) of musculoskeletal problems among school teachers of rural areas. These findings correspond with previous studies which also reported that there is high prevalence of musculoskeletal pain among school teachers^[22]. We have reported that teachers have to work six to eight hours per day. All teachers mentioned that their job demand requires prolonged standing almost more than half of work time. Teachers also experience stress due to workload^[23]. These all can be reason for high prevalence of musculoskeletal pain among school teachers of rural areas.

Almost 19% teachers had low back pain as well as all body pain. Next most common site for pain was knee joint (14%) followed by heel pain and wrist pain (8%). Similar findings were given by Jian Shuai et.al (2014) who concluded that the prevalence of Lower back pain, all body pain and knee pain was more which can be results of prolong standing and most of teachers also reported that they have to travel for 1-2 hours as they have to reach to rural areas by using public transport^[24, 25]. Intervention

was given for 4 weeks about musculoskeletal problems, onsite ergonomic training along with workplace exercises were given. After that prevalence of musculoskeletal pain was significantly reduce to 59% post treatment and post 1 month follow up it was 38%. The prevalence was declined after 4 weeks intervention in low back, knee pain, heel pain, wrist and finger pain, shoulder pain, neck pain. There was also change in the intensity of pain which was significantly reduced after 4 weeks of intervention. This study showed positive results in frequency of pain. The reduction in pain symptoms was long term. It can be hypothesize that increase physical activity can result in reduction of pain. Many systematic reviews have reported that pain self management programs have small to moderate benefits for patients with chronic musculoskeletal pain^[25] and maybe cost-effective as well^[26]. A systematic review of 46 randomized clinical trials found that pain self-management programs led by healthcare professionals were more beneficial, and the shorter programs (<8 weeks) were as effective as longer programs. Our program was for 4 weeks which corresponds to these findings. Change in Attitude in pre, post and follow up was significant but our study has reported that long term practices and continuous frequent feedbacks are necessary for long term change in attitude.

According to the Trans theoretical Model which states that people differ in their capacity to accept a new behavior. According to the Trans Theoretical Model, individuals adapt a new behavior go through following phases of change: (1) pre-contemplation that is no intention of changing behavior within the next 6 months; (2) contemplation-intends to make a change behavior within the next 6 months; (3) preparation - intends to make a change behavior within the next 30 days and have a plan of action; (4) action

- have made overt behavior change within the past 6 months; (5) maintenance - have maintained the overt change in behavior for over six months and (6) relapse - returning to older behavior^[27, 28].

Trans Theoretical Model (TTM) assumes that progressive movement from stage to stage is also associated to differences in perceived self-efficacy, decisional balance reflects the weighting of the perceived advantages and costs or barriers of behavior change. We also found that the 4 weeks health education and intervention also helped to changed attitude towards maintaining healthy lifestyle create awareness among school teachers of rural areas.^[27, 28]

We found that there is significant improvement in the knowledge pre post and follow up also shows significant improvement. Maintenance of healthy posture during daily activities may help to protect the musculoskeletal system and helps to prevent overload and postural alterations which may lead to discomfort and pain. However, a lack of knowledge and adequate instruction may result in inadequate postural habits, which in turn may lead to structural deformations and pain.²⁹

The results of the present study showed that, improvement of knowledge and practices post intervention and follow up helps to reduce the musculoskeletal symptoms.

Conclusion: It is concluded that 4 weeks of health education and ergonomic intervention reduces pain, improves knowledge and changes attitude but for long term change in attitude, a long duration programs and frequent feedbacks are required. This can be a regular intervention for School teachers for better health outcomes.

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Authors' Contribution: All authors helped in all sections of the study, They read the last

version of the manuscript and confirmed it.

Conflict of Interest : No conflict of interest.

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