



# PREVALENCE OF WORK-RELATED MUSCULOSKELETAL DISORDERS AMONG FEMALE SCHOOL TEACHERS BETWEEN 25-40 YEARS AGE GROUP IN JALGAON CITY

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## ABSTRACT

**Background:** Musculoskeletal disorders are significant public health problem due to their high impact on disability, personal suffering, absence from work. Repetitive movements, awkward postures and high impact forces are the primary risk factors for work-related musculoskeletal disorders. Among different populations studied, school teachers are at higher risk of developing musculoskeletal disorders.

**Aim and Objectives:** The aim of this study is to find out prevalence of work-related musculoskeletal disorders among female school teachers between 25-40 years age group in Jalgaon city.

**Materials and methods:** The cross-sectional study was conducted on 75 female school teachers between 25-40 years age group in Jalgaon city. A demographic data and Nordic Musculoskeletal Questionnaire were filled by them. The NMC was used to find out prevalence of MSDs in different 9 body parts for 12 months, 7-days and functional impairment due to pain.

**Results:** The total prevalence of work-related MSDs during last 12-months was 30.8%, 18.8% for last 7-days and 16% for work limiting pain in last 12-months. MSDs commonly found on lower back (54.7%), foot/ankle (46.7%) and neck (41.3%) followed by knee and shoulder.

**Conclusion:** Female school teachers between 25-40 years age group had shown 30.8% prevalence for work-related musculoskeletal disorders. Highly affected body parts are lower back, foot/ankle and neck. They are prone to have higher MSDs prevalence according to current results.

**Keywords:** musculoskeletal disorders, female school teachers.

## INTRODUCTION

According to the World Health Organization (WHO), the term work-related musculoskeletal disorders describes as musculoskeletal disorders which is supposed to be caused by any occupation.<sup>1</sup>The origin of musculoskeletal disorders is complex and multifactorial whose risk factors can be grouped into four categories of genetic, anatomical, psychological and biomechanical factors.<sup>2,3</sup> Musculoskeletal disorders are significant public health problem due to their high impact on disability, personal suffering, absence from work and their direct and indirect costs to health care system.<sup>4</sup> Complaints of musculoskeletal pain or discomfort are associated with physical disability and affect health related quality of life.<sup>5</sup>

Global Burden of Disease Study demonstrates the impact of musculoskeletal diseases as the second greatest cause of disability globally in all regions of the world.<sup>6</sup> Onset of musculoskeletal disorders have a marked deleterious effect on quality of life.<sup>7</sup>

Musculoskeletal disorders include wide range of inflammatory and degenerative conditions affecting the muscles, tendons, ligaments, joints, cartilage, spinal discs, peripheral nerves and supporting blood vessels.<sup>6,8</sup> Musculoskeletal conditions cover 150 diseases and syndromes associated with pain and impaired physical function. It consists short duration to lifelong disorders like osteoarthritis, rheumatoid arthritis, osteoporosis and low back pain.<sup>9</sup> Body regions most commonly involved are the low back, neck, shoulder, forearm and hand ,although lower extremity has received more attention.<sup>6</sup>

Repetitive movements, awkward postures and high impact forces are the primary risk factors for work related musculoskeletal disorders.<sup>10</sup> These are occurred due to repeated movements in a fixed or constrained body postures without sufficient recovery time, forces constrained on body parts lead to musculoskeletal pain.<sup>11</sup>

Employment is an essential part for the earning in the life of every human being, but it can become a health hazard if it is job is not carried out in an inappropriate way.<sup>12</sup> Among different populations studied, it was clear that teachers are at higher risk of developing musculoskeletal pain although prevalence among them was not uniform and ranged between 23.7% and 95.1%.<sup>13</sup> MSD decreases the productivity at work due to sick leave, absenteeism, and early retirement.<sup>12</sup>

Teachers' work involves not only teaching students, but also preparing for classes, evaluating the work of students, and participating in various school activities and programmes. This can result in teachers suffering from adverse mental and physical health problems due to the multitude of job tasks.<sup>14</sup>

The work tasks of school teachers often involve significant use of a head down posture, such as frequent reading and marking of assignments, teaching duties and those that require sustained mechanical load and constant trunk flexion.<sup>12,13</sup>

Some studies reported that physical factors such as prolonged standing, sitting and uncomfortable posture are known to be associated with increased prevalence of MSD.<sup>15</sup> In addition, several studies suggest that psychosocial factors including high workload and demands, high perceived stress levels, low social support, low job control, low job satisfaction and monotonous work are associated with MSD among school teachers.<sup>16,17</sup>

Apart from the working hours, female teachers have to perform their duties toward family and children which leads to more prone to the musculoskeletal disorders.

The promotion of regular physical exercise and prevention of excessive stresses during work are initiatives assumed to reduce incidence of musculoskeletal pain.<sup>18</sup>

The self-rating Nordic Questionnaire is a standardized questionnaire to assess the prevalence of musculoskeletal symptoms.<sup>19</sup> It is used to determine the location of musculoskeletal disorders. Using this questionnaire, the respondent should determine which of the part of her body has suffered during the last 12 months.<sup>2</sup> The validity and reliability of this questionnaire have been investigated and approved indifferent studies and several languages.<sup>19</sup> The purpose of the present study is to evaluate the prevalence of musculoskeletal disorders among female school teachers between 25-40 years age group.

## **AIM**

To study the prevalence of work-related musculoskeletal disorders among school teachers between 25-40 years age group.

## **OBJECTIVE**

To determine the prevalence of work-related musculoskeletal disorders among school teachers between 25-40 years age group.

## **MATERIALS AND METHODOLOGY**

The one time survey cross-sectional study was conducted on 75 female school teachers in Jalgaon city. The convenient sampling was taken from different schools in Jalgaon city with inclusion and exclusion criteria. The sample size calculated using Cochran's formula. A Nordic Musculoskeletal Questionnaire was used as outcome measure.

- Inclusion criteria –
1. Age 25-40 years
  2. Work experience at least one year
  3. Both married and unmarried women

- Exclusion criteria –
1. Any diagnosed case of musculoskeletal/ neurological disorders
  2. Pregnancy at the time of survey
  3. Any recent fracture or trauma

## PROCEDURE

The study was approved by the ethical committee of Dr. Ulhas Patil College of Physiotherapy, Jalgaon. School authorities were approached to conduct the study and samples were collected from that schools. Subjects was taken according to the Inclusion and Exclusion criteria. A written consent form (Annexure no.-1) was given to the female school teachers who were willing to participate in study. The procedure was explained to the subjects by giving information sheet (Annexure no.-2). The aim and objectives of the study was explained to the willing participants. The evaluation sheet (Annexure no.-3) was given to the participant to fill it. There were two sections present in evaluation sheet: section –A & section –B.

Section –A : Socio-demographic data i.e. name, age ,gender, occupation, height, weight, Body Mass Index, daily working hours, number of children.

Section –B: Nordic Musculoskeletal Questionnaire.

It consist 3 questions for nine different anatomic body regions ( neck, shoulder, elbow, wrist/hand, upper back, lower back, hip/thigh, knee, ankle/feet):

- 1) Have you at any time during the last 12 months had trouble (ache, pain, discomfort, numbness)?
- 2) Have you at any time during the last months been prevented from doing your normal work (at home or away from home) because of trouble?
- 3) Have you had trouble at any time during the last 7 days?

If subjects get difficulty to fulfill the evaluation sheet which was guided by researcher. Response was recorded in yes/no alternatives.

## STATISTICAL ANALYSIS

The data was collected and enrolled in Microsoft excel sheet and it was been analyzed on descriptive statistic of IBM SPSS statistics version 28.0.0.0. Data were presented using descriptive statistics in form of frequencies and percentages for qualitative variables and mean and standard deviation (SD) for quantitative variables.

## RESULTS

A total of 75 participants have been recruited in that minimum age of participants is 25 and maximum age is 40 with mean  $33.14 \pm 4.80$ . The average BMI of female teachers is 22.57 with a standard deviation 3.93. Maximum number of participants lies between 18.5-24.9 i.e. normal BMI (table 1 and fig.1)

BMI	Frequency	Percentage
Underweight(<18.5)	12	15.80%
Normal(18.5-24.9)	44	58.10%
Overweight(25.0-29.9)	15	19.90%
Obese class 1(30.0-34.9)	4	5.30%

table1: body mass index

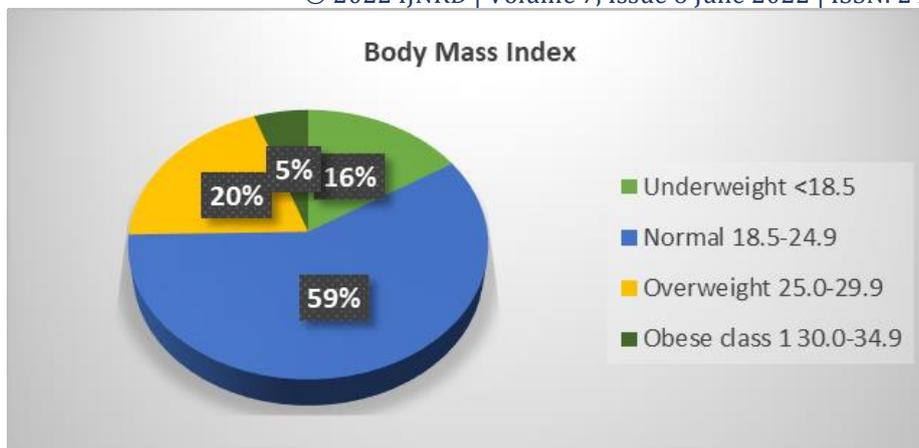


fig.1: body mass index

The duration of being working women with mean is  $8.28 \pm 4.83$ . The daily working hours of female school teachers are  $6.58 \pm 1.36$ . The percentage of married and unmarried female teachers are 86.7% and 13.3% respectively.

From statistical analysis found that the prevalence of work related musculoskeletal disorders among female school teachers is 30.8%. The most affected body sites are lower back (54.7%), foot/ankle (46.7%), neck (41.3%) followed by knee (40.0%), shoulder (30.7%), upper back(29.3%), wrist/hand(16.0%),hip/thigh(10.7%). Least prevalence present in elbow (8.0%). (table no.2)

Have you at any time during the last 12 months had trouble(ache, pain, discomfort, numbness) in:		
Site	Frequency	Percentage
Neck	31	41.3%
Shoulder	Right	14
	Left	3
	Both	6
Elbow	Right	5
	Left	1
Wrist /Hand	Right	11
	Both	1
Upper Back	22	29.3%
Lower Back	41	54.7%
Hip/Thigh	8	10.7%
Knee	30	40.0%
Foot /Ankle	35	46.7%

table no. 2: prevalence of 12 months

Due to the musculoskeletal pain, 16.0% female school teachers prevented from doing their normal work in last 12 months. (Table no.3) 18.8% female school teachers having trouble during last 7 days. (Table no.4)

table no.3: prevalence for work limiting during last 12 months

Have you had any time during last 12 months been prevented from doing your normal work?		
Site	Frequency	Percentage
Neck	18	24.0%
Shoulder	11	14.7%
Elbow	4	5.3%
Wrist	9	12.0%
Upper Back	8	10.7%
Lower Back	24	32.0%
Hip/Thigh	4	5.3%
Knee	15	20.0%
Foot/Ankle	16	21.3%

table no.4: prevalence of 7 days

Have you had trouble at any time during the last 7 days?		
Site	Frequency	Percentage
Neck	16	21.3%
Shoulder	13	17.3%
Elbow	6	8.0%
Wrist	7	9.3%
Upper Back	14	18.7%
Lower Back	24	32.0%
Hip / Thigh	9	12.0%
Knee	17	22.75%
Foot /Ankle	22	29.3%

## DISCUSSION

Our results showed considerable prevalence of MSD affecting several parts of the body may be due to the variety of activities that female teachers perform each day at work. Mostly affected body parts are lower back, ankle/foot, neck, knee, upper back, shoulder and the least affected parts are wrist, hip/thigh and elbow.

In accordance with the present study, done by Ayuni Nabilah Alias et al showed that the prevalence for any parts of the body was 40.1%.<sup>20</sup> One study in Brazilian public school teachers found a prevalence of work-limiting pain in any part of the body is 47.4%.<sup>17</sup> Converso et al. reported a prevalence of 42.9% suffering moderate to severe limiting musculoskeletal pain in nursery school and kindergarten teachers in Italy.<sup>17</sup> Souza et al., was given 24.3% MSDs prevalence among elementary school teachers in Brazil<sup>21</sup> supporting the result of the present study in which prevalence of MSDs is 30.8%. Eric patience et al, (2022) stated that prevalence rates of general MSDs in Asia region range between 21.1%-93.%.<sup>22</sup>

In the present study, most prevalent body site on which teachers reported pain was lower back (54.7%). The prevalence of low back pain was equivalent to that recorded among Ethiopian teachers (53.80%) (Beyen et al.,2013), 40.40% among Indian teachers (Samad et al., 2010).<sup>20</sup>The risk factors for LBP are individual factors such as body weight and age, biomechanical factors such as heavy physical load, twisted posture, etc. Chairs without proper back support are the main factor to cause back pain as teachers sit with flexion of trunk without back support to write and read text and excessive flexion of hip and knee.<sup>12</sup>

According to findings, foot/ankle affect 46.7% female teachers. It is similar to the study in Botswana (37.8%) (Erick & Smith, 2014) and Iranian teachers in high school (46.8%) (Mohammadi, 2013).<sup>20</sup>

In this current study, 40% knee pain and 10.7% hip/thigh pain is reported. Yadav A. et al (2018) also reported, 37.5% teachers from Delhi suffer from knee pain. This may be due to prolonged standing postures during teaching hours and other school related activities which in turn increases load on the knees joints.<sup>23</sup> Concerning thighs/hips, the occurrence was lower than that stated by teachers in Bolivia (31.9%).<sup>20</sup>

The prevalence of neck pain is 41.3% which is relatable with previous research done by Yue et al. (2012) in China (48.7%).<sup>20</sup> Neck pain among the school teachers is mainly due to awkward posture - sitting with poking chin which induce considerable load on the posterior structures of spine.<sup>24</sup> Use of 'head down' posture for frequent reading and marking of assignments might have caused this significant percentage of teachers to complain neck pain.<sup>23</sup>

As far as upper back MSD is concerned (29.3%), comparison can be made to a 36.9% upper back pain stated by Cavlak et al.(2011). It is present due to standing postures used while teaching and poor posturing while seated works mostly forward bending of neck and upper back.<sup>23</sup>

In this study, MSD in shoulder, elbow and wrist is 30.7%, 8% and 16% respectively. Vaghela NP et al.,(2018) gives similar values for shoulder (33.12%), elbow( 4.30), wrist(15.75).<sup>12</sup> Activities like overhead writing on board, assignment correction, head down postures with protracted shoulder results into the upper limb musculoskeletal dysfunction.

The participants shows 18.8% prevalence in last 7 days. It is relatively high if we compare with Brazilian teachers, where 7-days prevalence was 15.9% in 2011 given by De Ceballos et al.<sup>12</sup> The total prevalence for functional impairment is 16%.

## CONCLUSION

Female school teachers between 25-40 years age group had shown 30.8% prevalence for work-related musculoskeletal disorders. Highly affected body parts are lower back, foot/ankle and neck. They are prone to have higher MSDs prevalence according to current results.

## LIMITATIONS OF THE STUDY

1. Risk factors should be find out in school teachers.
2. Sample size is small.

## CLINICAL IMPLICATION

You can give ergonomic advices, avoiding stress on body, performing mild exercise like stretching, range of motion during working hours.

## FUTURE STUDY SCOPE

1. Study should be performed on large sample size.
2. It can be conducted on male teachers from same age group.
3. Risk factors should be find out.
4. Posture evaluation of the candidates can be done for better ergonomic advices.

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