# PREVALENCE AND RISK FACTORS OF MUSCULOSKELETAL DISORDERS AMONG SPECIAL EDUCATION TEACHERS. A COMPREHENSIVE SURVEY STUDY

**Authors:** Noreen Kiran[1], Aliza Pervaiz[2], Sahar Imran[3], Ali Haider[4], Ruhmah Amin[5]

Department of Rehabilitation Sciences, Student, The University of Faisalabad, Faisalabad, Pakistan [2,3,4,5]

Department of Rehabilitation Sciences, Senior lecturer, The University of Faisalabad, Faisalabad, Pakistan [1]

**Correspondence: Noreen Kiran***

**ABSTRACT**

**INTRODUCTION:** Musculoskeletal disorders are important and common health problems among special education teachers. Special education teachers deal with students who have physical disabilities. These teachers often experience muscle strains. However, musculoskeletal disorders have been neglected in this population.

**AIMS AND OBJECTIVES:** The aim of this study was to determine the prevalence and its association with the risk factors of musculoskeletal disorders among special education teachers.

**MATERIALS AND METHOD:** Cross sectional survey was conducted to estimate the prevalence of musculoskeletal disorders in special education teachers. Sample population followed the inclusion and exclusion criteria. Sample size was 92 collected through purposive sampling technique. Data was collected from special education centers of Faisalabad. Modified Nordic musculoskeletal Questionnaire and job factor questionnaire were used by our research team members. The domains of questionnaire includes demographic data, prevalence of musculoskeletal disorders and their risk factors.

**RESULTS:** The mean age of population was 37.08. The neck, low back, shoulder, and knee prevalence rates were much higher, according to the results. The prevalence rates are as follows: 64.1% in the neck region, 50.0% in the shoulder, 51.1% in the low back, and 39.1% in the knees. There was significant association present between repeating the same work multiple times and prevalence of musculoskeletal disorders.

**CONCLUSION:** The results shows that the regions having high prevalence of musculoskeletal disorders are neck, low back, shoulder, and knees. Additionally, doing the same work repeatedly is a risk factor that contribute to musculoskeletal problems.

**KEYWORDS:** Musculoskeletal disorders, Job factor, Work-related musculoskeletal disorders, special education teachers, MSDs, risk factors, Modified-NMQ.

# INTRODUCTION

Musculoskeletal disorders are health complications that contains a widespread range of inflammatory and degenerative conditions which affects the muscles, tendons, nerves, joints, ligaments and bones and can happen from a single or several traumas(1).

Musculoskeletal disorders are pathologies of musculoskeletal system which produces pain and are occasionally present with movement limitations. They are most prevalent public health issues amongst the working people and the general worldwide population, being one of the leading causes of work absenteeism and causing chief financial costs for national health systems globally(2).

Special education teacher are the ones who are working with students with an extensive range of learning, mental, physical and emotional disabilities. For dealing with students with disabilities, special education teachers have an extra set of tasks and programs compared to regular teachers. They also provide nursing care to disabled students such as lifting and moving to other place, feeding them food, changing their diapers, and helping them in ambulation. Musculoskeletal disorders are mostly suffered by teachers in the shoulder, lower back, knee, and wrist(3).

A teacher's duties involves teaching the students, writing on the board, preparing lessons to teach, grading their assignments, and school administration work, which leads to severe mental and physical health issues. Additionally, age, gender, working hours, and uncomfortable postures are associated with a high prevalence of Work-related musculoskeletal disorders(4).

These students undergoes delayed development due to which special education teachers often perform activities that involves sustained period of standing, kneeling, bending and squatting that leads to musculoskeletal issues. Prolong static trunk flexion leads to lower back pain. Additionally gender, age, duration of working hours and awkward body postures leads to musculoskeletal disorders. Also the physical demands include pushing and pulling of students multiple times a day due to which special education teachers exhibits abnormal muscle tone(5).

The modified Nordic Musculoskeletal Questionnaire (NMQ) analyzes musculoskeletal pain and activity inhibition in 9 different body regions. The purpose of this study was to gain better information regarding musculoskeletal disorders among special education teachers(6).

This modified Nordic Musculoskeletal Questionnaire have different parts. This questionnaire is being used in order to gather data about musculoskeletal signs such as body ache, pain or discomfort in different regions of the body. The modified Nordic musculoskeletal questionnaire enumerates activity hindrance in nine body regions, gives trustworthy evidence concerning the beginning, prevalence and consequences of musculoskeletal disorders. All substances were counted within a collection of 0–100. This basic measure was conveyed to be beneficial in clinical practice, research, health policy assessments and population investigations and surveys(7).

The use of the Job Factors Questionnaire to determine the risk factors for musculoskeletal disorders offers various important options. Because of these various risk factors, Job Factors Questionnaire was used(8). Special education teachers have prevalence of musculoskeletal disorders ranging from 35%-95%(9). In 2019, according to the WHO "musculoskeletal disorders were the leading cause of disabilities globally and responsible for the greatest amount of loss of output at the workplace(10).

The use of non-ergonomic educational furniture increases the risk of musculoskeletal problems, and high stress and emotional demands exacerbate the problem. Therefore, the results of the study will be helpful in development of ergonomic evaluation and postural correction programs that would enhance the health and wellbeing of special education teachers. It will be also helpful in evaluating and minimizing the musculoskeletal disorders risk factors in special education teachers.

## METHODOLOGY

An observational cross-sectional study was carried out over a period of four months from. Data were gathered from three special education centers: the Govt. Secondary School of Special Education, the Govt. Special Education Center, and the ABA Center of Special Education, Faisalabad, Pakistan. The sample size of 92 was determined using the Epi Tool. Data was collected by using a purposive sample approach. Participants consists of female and male special education teachers, ages 20 to 35, who had given their consent and had at least six months of teaching experience. Teachers with a history of recent surgery or trauma, a BMI of more than 30, or who were pregnant were excluded. The study evaluated risk factors for musculoskeletal disorders using a job factor Questionnaire and the Modified Nordic Musculoskeletal Questionnaire (MNMQ), which determined the prevalence of musculoskeletal issues in nine body regions.

# RESULTS

Results were analyzed by SPSS version 23 and described with the help of frequency tables of all the taken variables and bar chart.

**Table 1: Table representing the prevalence rate and total length of time of trouble in different regions.**

| Regions/questions | Neck | Shoulder | Elbow | Wrist | Upper back | Low back | Hips | Knees | Feet/ ankles |
|---|---|---|---|---|---|---|---|---|---|
| Trouble in 12 last months (%) | 64.1 | 50.0 | 20.7 | 35.9 | 22.8 | 51.1 | 22.8 | 39.1 | 23.9 |
| Prevented from doing work (%) | 23.9 | 22.8 | 8.7 | 26.1 | 9.8 | 41.3 | 12.0 | 19.6 | 6.5 |
| Trouble in last 7 days (%) | 21.7 | 14.1 | 3.3 | 5.4 | 7.6 | 23.9 | 6.5 | 8.7 | 10.9 |
| Met an accident (%) | 19.6 | 13.0 | 14.1 | 13.0 | 12.0 | 5.4 | 7.6 | 21.7 | 7.6 |
| Trouble In 7-30 days (%) | 17.4 | 7.6 | 9.8 | 10.9 | 7.6 | 14.1 | 7.6 | 19.6 | 10.9 |
| Trouble more than 30 days (%) | 25.0 | 6.5 | 3.3 | 4.3 | 3.3 | 30.4 | 3.3 | 2.2 | 2.2 |
| Trouble everyday (%) | 6.5 | 2.2 | 7.93 | 3.3 | 6.5 | 6.5 | 2.2 | 4.3 | 2.2 |
| Seen by a doctor (%) | 10.9 | 7.5 | 4.3 | 12.0 | 14.1 | 28.3 | 22.8 | 14.1 | 4.3 |

Above given table showing that the most often affected locations are the neck and lower back, with 64.1% and 51.1% of respondents, respectively, reporting problems in the previous 12 months.

There is a noticeable impact on the everyday activities and health of special education teachers in these regions, as seen by the significantly greater percentages of prevented work and recent trouble.

**Figure 1: Pie chart representing the population in different categories of risk factors.**
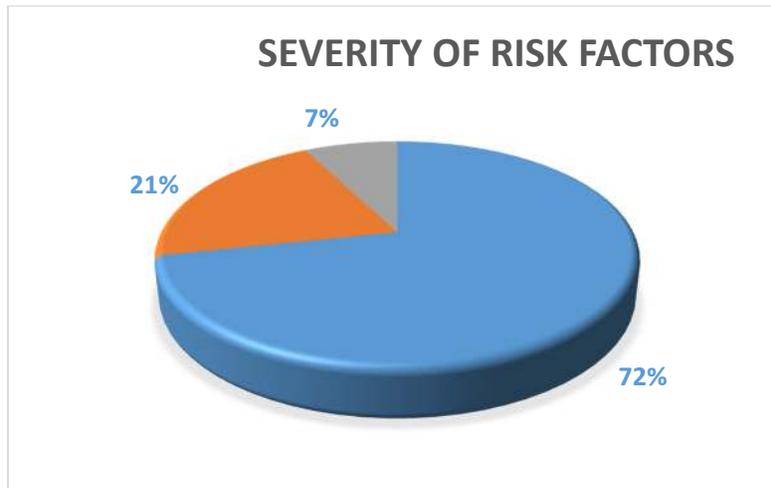


The above given pie chart showing the population that lies in three different categories of risk factors. Out of 92, 21.74% population had less problematic risk factors, 20.85% had moderate problematic risk factors and 7.81% had severe problematic risk factors.

**Table 2: Table showing association between performing the same task several times with different body regions.**

| Regions | p-values |
| --- | --- |
| Neck | 0.039 |
| Shoulder | 0.018 |
| Elbow | 0.016 |
| Wrist | 0.000 |
| Upper back | 0.654 |
| Low back | 0.000 |
| Hips/thighs | 0.005 |
| knees | 0.000 |
| Feet | 0.001 |

This table shows that there is a statistically significant association between performing the same task several times and discomfort in body regions, including the neck, shoulders, elbows, wrists, lower back, hips/thighs, knees, and feet/ankles. But there is no apparent correlation between this risk factor and upper back region as thoracic spine, or upper back, gets exposed to different forms of mechanical loading. Research suggests that the thoracic spine's structural support from the rib cage, which aids in more equally distributing mechanical loads across the spine, makes it more resilient to damage from repetitive loading. Musculoskeletal pain has less of an impact on the upper back because of its anatomical and functional characteristics as well as the type of muscle engagement, even though repetitive tasks may exacerbate this condition(11).

## DISCUSSION

The purpose of this cross-sectional study was to determine the prevalence and risk factors of musculoskeletal disorders. Sample size of 92 participants consists on male and female special education teachers. It was observed that the prevalence rate of musculoskeletal disorders are much higher in neck, low back, Shoulder and knee region in special education teachers. Also there is a statistically strong correlation between performing the same task several times and discomfort in body regions, including the neck, shoulders, elbows, wrists, lower back, hips/thighs, knees, and feet/ankles. But there is no apparent correlation between doing the same task several times and the upper back region. In a previous study conducted in Kota Kinabalu and Penampang reported prevalence rate of 77% and the regions that are most effected were feet, low back, neck, knees and shoulder which is similar to the reported rates of Taiwan(86%), Kelantan(72%) and Italy(85.9%) respectively(12).

In another study conducted in Malaysia on musculoskeletal disorders of special education teachers reported that the prevalence rate of musculoskeletal disorders are 77.9% and the regions that are most effected includes shoulder, neck and knees(13).

In 2019, another study conducted in South Africa reported the prevalence rate of 83.1% and average prevalence of shoulder was 58% and in china the shoulder musculoskeletal issues prevalence rate were 73.4% (14).

Another study conducted in Germany revealed that the prevalence rate of low back was 38.7% and in current study prevalence rate of low back issues are 51.1%(15). There is another study that showed high prevalence of neck, shoulder and low back pain among school teachers in Punning, China which are similar to current study because prevalence rate is much higher in these regions than the other regions(16).

Studies reported that the repeated movement tasks frequently involve several muscle units. For example, upper body duties usually include greater movement in the arms and shoulders than in the thoracic spine. The deltoids and pectorals, which are the main muscles used in these exercises,

take up most of the tension, preventing the upper back from suffering severe repetitive strain(17, 18).

## CONCLUSION

The neck, low back, shoulder, and knee prevalence rates were much higher, according to the results. The prevalence rates are as follows: 64.1% in the neck region, 50.0% in the shoulder, 51.1% in the low back, and 39.1% in the knees. Also there is a statistically significant association between performing the same task several times and discomfort in body regions, including the neck, shoulders, elbows, wrists, lower back, hips/thighs, knees, and feet/ankles. But there is no apparent correlation between this risk factor and upper back region as upper back is protected and stabilized by rib cage. So, it is less likely to be effected than other regions.

## LIMITATIONS OF STUDY

- Findings from a specific region or demographic group cannot be generalizable to other settings or populations.
- These studies do not account for changes over time, such as the progression of MSDs or the impact of long-term interventions.
- MSDs are influenced by a combination of physical, psychosocial, and personal health factors, making it challenging to isolate the impact of specific risk factors
- Conducting comprehensive research, especially longitudinal studies, requires significant resources in terms of funding, time, and personnel

## RECOMMENDATIONS

- The risk of musculoskeletal problems in special education teachers can be reduce by setting up an ergonomic workspace that includes supportive shoes and flexible furniture.
- Musculoskeletal health can be preserved by taking regular pauses, working on your strength and flexibility, and adopting low-impact workouts like yoga or walking. To lessen musculoskeletal issues, assistive devices like lifting aids must be used properly.
- Causative factors can be reduced by stress management strategies such as mental health support and relaxation exercises.

- Together with the proper workplace modifications, ergonomic and posture first aid training can also help avoid and address these problems, resulting in a safer and more comfortable working environment.

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