



COMPARISON OF PREVALENCE OF MUSCULOSKELETAL DISORDERS BEFORE AND DURING LOCKDOWN IN SCHOOL GOING CHILDREN WHO ATTENDED ONLINE LECTURES DURING COVID-19 PANDEMIC – A CROSS SECTIONAL STUDY.

Physiotherapy

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ABSTRACT

Background: The COVID-19 pandemic has led to a change in the education sector in India. Online mode of teaching was implemented. Musculoskeletal pain among school-going children is a well-known concern acknowledged by WHO. This study aimed to compare the prevalence of musculoskeletal pain disorder before and during lockdown in school-going children who attended online lectures during the COVID-19 pandemic in India. **Methods:** A cross-sectional study was conducted in a sample of 150 students from 8th to 10th standard in both males and females. The Primary Questionnaire was a modified Nordic questionnaire. Data was compiled in MS Office Excel sheet (v 2019), Microsoft Redmond campus, Redmond, Washington, United States). Data was subjected to statistical analysis using Statistical Package for Social Sciences (SPSS v 26.0, IBM) **Results:** It was found that the prevalence of pain in the neck and shoulder region was significantly high before the lockdown as compared to the pain during the lockdown. **Conclusion:** This study concludes that musculoskeletal pain was prevalent before and during the lockdown, with more prevalence of pain in the pre-lockdown situation.

KEYWORDS

Pandemic, COVID-19, lockdown, online learning, musculoskeletal pain disorders.

INTRODUCTION

The World Health Organization (WHO) declared The Novel coronavirus disease (COVID-19) an international public health emergency.^[1] As a result of the pandemic, millions of people have suffered, and they have faced multiple changes in their lifestyles. More of these changes happened due to the implementation of national lockdowns in most of the countries around the world.^[1] In India, the lockdown was imposed from 23rd March 2020 till May 2020, after which there was a reopening phase for public services, but educational institutions, including schools and colleges, remained closed without a clear view of reopening.^[2] This created an emergency within the instructive division for understudies as well as teachers.^[2]

Musculoskeletal pain among school-age children is a well-known concern acknowledged by the WHO.^[3] There are 132 million school-going children in India. Studies among Indian school-going children have reported the prevalence of musculoskeletal pain to range between 55% and 86%.^[3,4] The Burden of low back pain is significant in school-going children.^[6] If students develop low back pain at a very early age, they are most likely to get chronic low back pain later on in their lives. Back pain is seen most commonly between the ages of 13 and 15 years with an equal distribution between genders.^[6]

The sudden and drastic changes in the educational sector due to the imposition of the national lockdown resulted in the implantation of an online mode of teaching and learning.^[7] The use of mobile phones by students has increased to a great extent. The mobile phone is considered not only as a communication device but also as a means of entertainment.^[8] The use of various gadgets and equipment to support learning activities as well as other school activities was seen, in which children tend to adopt positions that may cause pain and musculoskeletal changes, especially in the upper limbs and spinal vertebrae.^[1,9]

Musculoskeletal pain/disorders have direct and indirect effects on students' health. Indeed, at this age, the spine continues to grow and any kind of unbearable stress placed on the musculoskeletal system can lead to problems later in the child's life.^[3] Furthermore, recurrent musculoskeletal pain may impair study performance and affect the students' learning, working, and health during the transition of their

lives.^[1,10]

In India, multiple studies were performed on school-going children and according to those studies, the main reasons behind musculoskeletal pain disorders were travelling and school bag weight.^[3] Also, during lockdown, students were homebound with less physical activities and used to attend lectures online.^[11] Previous studies have shown the adverse effects of using electronic media on musculoskeletal pain disorders.^[12] That's why there was a need to conduct a study to find out the prevalence of musculoskeletal pain disorders during the lockdown and to compare it with the before-lockdown situation.

MATERIAL AND METHODS

This comparative cross-sectional study was conducted among school-going students from a metropolitan city. A total of 184 higher secondary students from standard 8th, 9th and 10th were included in the study. Among these, 76 females and 108 males attended online lectures for more than 4-5 hours for 2 years.

After taking demographic data, the Modified Nordic Questionnaire was used to assess areas of pain before and during the lockdown. Students were asked to fill out the questionnaire separately based on their experience during and before the Pandemic. A question was specific and in general to nine areas or parts of the body. The questionnaire was given to the students as a Google form.

Ethics

Approval was taken from the institutional review committee regarding research. Prior permission was taken from the School authorities, including teachers were informed about the research work.

Study Design

Selection And Description Of Participants:

A comparative cross-sectional study was performed in school-going students from a metropolitan city. A total of 150 school students were included in the study. School students from 8th to 10th std, who attended online lecture 4-5 hours and those who were able to read and understand language of questionnaire were included in the study. Students with having history of musculoskeletal pain disorders

because of any trauma, History of previous or recent surgery, and congenital deformity were excluded from this study.

Statistics:

All data entered into the computer but lacking encryption were checked for import errors.

The obtained data were compiled on MS Office Excel tables (v 2019, Microsoft Redmond Campus, Redmond, Washington, USA). Data was statistically analysed using the Statistical Package for the Social Sciences (SPSS v 26.0, IBM).

Descriptive statistics such as frequencies and percentages for categorical data and mean and standard deviation for numerical data were presented. Comparison of frequencies of variable types with groups was performed using the chi-square test.

RESULT

184 students participated in the study, out of which 76 were females (41.3%) and 108 were males (58.7%) in age group of 12-16 years included with mean of 14.79 age. These students attended online lectures for more than 4-6 hours with a mean of 4.64 hours.

Table 1 : Prevalence of pain before Lockdownn = 184

Areas	Yes (frequency)	Percent	No (frequency)	Percent
Neck	130	70.7	54	29.3
Shoulders	112	60.9	72	39.1
Upper Back	83	45.1	101	54.9
Elbows	41	22.3	143	77.7
Wrist/Hands	50	27.2	134	72.8
Lower Back	46	25.0	138	75.0
Hip/Thighs	27	14.7	157	85.3

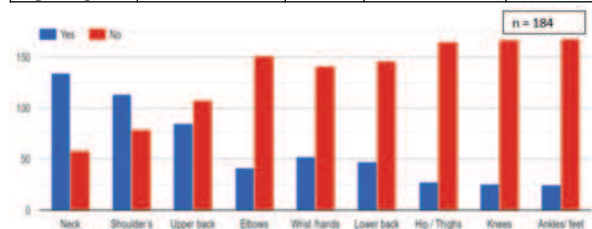


Figure 1 : Graphical representation of Pain Before lockdown

Figure 1 shows that prevalence of musculoskeletal pain was more in neck and shoulder with neck representing maximum number of musculoskeletal pain.

Table 2: Prevalence Of Pain During Lockdown

Areas	Yes (frequency)	Percent	No (frequency)	Percent
Neck	73	39.7	111	60.3
Shoulders	69	37.5	115	62.5
Upper Back	72	39.1	112	60.9
Elbow	30	16.3	154	83.7
Wrist/Hands	40	21.7	144	78.5
Lower Back	48	26.1	136	73.9
Hips/Thighs	16	10.2	165	89.7

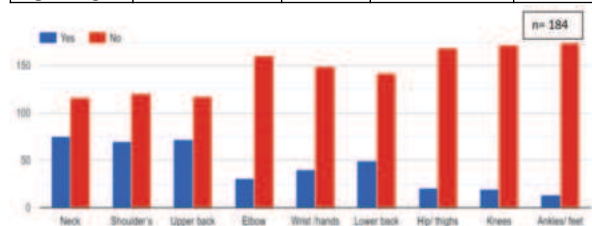


Figure 2: Graphical Representation Of Pain During Lockdown

Figure 2 shows that musculoskeletal pain was significantly reduced during lockdown in all joints.

Comparison between both groups was done using chi square test. After comparison of prevalence of pain in both situations it was found that prevalence of pain showed statistical differences in neck and shoulder region with more pain before lockdown.

Table 3: Comparison of prevalence of pain during and before lockdown in neck region.

		Time		Total	Chi-Square value	P value of Chi-Square test
		During	Pre			
	Neck	No 111	54	165		
	Yes	73	130	203	35.696	0.000**
		184	184	368		

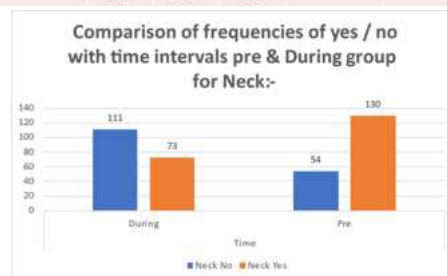


Figure 3: Comparison of prevalence of pain during and before lockdown in neck region.

There was a statistically high significant difference seen for the frequencies between the time intervals ($p < 0.01$) with higher frequency before lockdown.

Table 4: Comparison Of Prevalence Of Pain During And Before Lockdown In Shoulder Region.

		Time		Total	Chi-Square value	P value of Chi-Square test
		During	Pre			
	Shoulder's	No 115	72	187		
	Yes	69	112	181	20.103	0.000**
	Total	184	184	368		

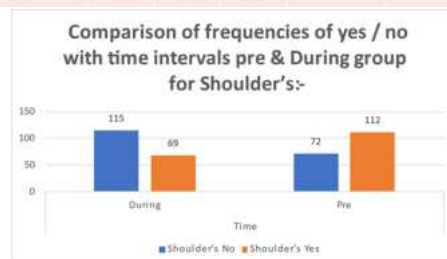


Figure 4 : Comparison of prevalence of pain during and before lockdown in shoulder region.

There was a statistically high significant difference seen for the frequencies between the time intervals ($p < 0.01$) with higher frequency before lockdown.

DISCUSSION

Musculoskeletal pain in school-age children is a well-known concern. School students from 8th to 10th standard who met inclusion criteria participated in this study. The first objective of this research was to analyse the prevalence of musculoskeletal pain disorders in school-going children before lockdown. The second objective of this research was to analyse the prevalence of musculoskeletal pain disorders in school students who attended online lectures during the COVID-19 pandemic in India. Comparing the prevalence of musculoskeletal discomfort before and during lockdown was the study's ultimate goal. The prevalence was noted on modified Nordic Questionnaire^[1]

The results showed that school children suffered most from neck pain (70.7%), followed by shoulder pain (60.9%). Upper back, wrists and lower back showed moderately high prevalence in spectrum of pain. The possible reasons for prevalence of pain in the neck, shoulders and back region could be attributed to students carrying two strap bags to school before lockdown. Weight of school bags and traveling factor were major concerns for shoulder pain^[13] Inappropriate sitting posture for longer duration in schools was the main reason for back pain and these possible reasons are in accordance with previous studies^[3,6] Previous studies have shown back aches in school going children is

mostly due to heavy backpacks. Heavy backpacks and carrying them for longer durations are a major cause of musculoskeletal pain.^[13]

Results showed that during lockdown more affection was seen in the neck, shoulders, wrists, upper back and lower back compared to other areas. The shift in the education system from classroom teaching to online learning could be a possible reason for these factors^[2] Students tend to adopt inappropriate posture with excessive usage of electronic media (computers, laptops, phone), during lockdown to support their academic activities as well as for entertainment purposes. These findings are in accordance with previous studies.^[1,8] Daily routine of students comprises sitting in a chair and carrying out a large number of curricular activities, which leads to musculoskeletal overload. Adapting to inappropriate posture leads to pain and musculoskeletal alteration in the upper limb and spine^[1]

After comparing the two situations it was identified that there was a reduction in the prevalence of pain during lockdown compared to before lockdown situation. The pain prevalence had a significant reduction in most of the areas. Possible reasons for the reduction in pain during lockdown were changes in the education system which had set liberty for students and reduced hours of teaching. There were no burdens of carrying heavy school bags and traveling to school as an online mode of teaching had been implemented during the lockdown^[2] Online education provided students to do more physical activities and was another reason for the reduction in pain during lockdown^[1]

CONCLUSION

To our knowledge this was the first study which compared prevalence of musculoskeletal pain before and during lockdown. This study concluded that musculoskeletal pain was prevalent both before and during lockdown however on comparison it was found out that the prevalence was more in shoulder and neck region before lockdown compare to during lockdown.

Limitation

The study had a few limitations. Primarily, no other assessment equipment was used other than Modified Nordic Musculoskeletal Questionnaire to locate area of pain. Also, we did not evaluate students other than higher secondary standards.

Clinical Implications

Ergonomic exercises to prevent neck, shoulder and back pain are important for growing children and should be included in a holistic school program.

Future Scope Of Study

Future studies can focus on studying larger sample sizes. There is need to find out the reason why shoulder and back pain are more prevalent than prevalent of pain in other joints. Also further studies should be done to study reduction of pain during lockdown.

Institutional Review Board Statement

The research was approved by the Institutional Research Committee of Dr G. D. Pol Foundation's, YMT college of Physiotherapy, Kharghar, Navi Mumbai. Maharashtra university of health science, Nashik. with Approval number YMT/BPTh/40/2021

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