International Journal of Multidisciplinary Research and Development
www.allsubjectjournal.com
ISSN Online: 2349-4182 ISSN Print: 2349-5979
Received: 15-11-2024, Accepted: 16-12-2024, Published: 31-12-2024
Volume 11, Issue 12, 2024, Page No. 84-89

Prevalence of and factors affecting the neck pain in school teachers of Surat city: A cross-sectional survey

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Abstract
Background: Neck pain is common worldwide and affects over 3,50,000 people annually, including teachers. The study aimed to investigate the prevalence of neck pain, factors affecting neck pain and teachers' response to it among school teachers in Surat city.
Materials & methods: This online cross-sectional survey study included 287 school teachers from both public and private schools. Teachers were invited using electronic media and data was collected using anonymous questionnaire formed using Google forms. Demographic and neck pain related data were obtained. Data were analysed using frequency distributions and adjusted logistic regression analyses.
Results: A total of 287 teachers participated in the study (age: 44.17 $\pm$ 8.30 years) with 43.90% reported neck pain. The sample included more female (n=162) as compared to male (n=125). A positive correlation of female gender and per day working hours was found with presence of neck pain at $p<0.05$.
Conclusion: Neck pain is highly prevalent in school teachers of Surat city. Female teachers and teachers working under stressful condition for increased hours per day have more risk of development of neck pain.

Keywords: India, neck pain, prevalence, teachers, WMSDs

Introduction

Background

Work-related Musculoskeletal Disorders (WMSDs) is defined as injuries or disorders of the musculoskeletal system, which is associated with exposure to risk factors in the workplace. Physical demands that are imposed on the body at the work place such as awkward or fixed posture for a long time, heavy lifting, and repetitive tasks are reported to be the causes or aggravating factors for WMSD [1]. School teachers' daily activities involve significant use of head down postures, such as prepare lessons, frequent reading, assessing/marking students and writing on blackboard under unfavourable working conditions, such daily tasks repeatedly for a long period of time using abnormal posture; they might develop pain or discomfort around shoulder/neck body segments [2, 3].

In comparison to the other occupational groups, school teachers have shown to report a high prevalence rates of neck pain between 40% and 95% which were attributed to various factors including individual factors (age, gender, and length of employment); physical factors (working with computer or visual display unit, working posture and duration); and psychosocial factors (job stress, job satisfaction, work demand, and colleague support) [4, 5, 6, 7]. Neck pain among teachers is a common reason for increased healthcare costs in terms of treatment, individual suffering, and time lost due to work absenteeism; significantly affecting quality of life (QoL) and resulting in a significant financial burden from lost and compensated wages earnings [8, 9]. Awareness regarding WMSDs and encouragement towards the habit of regular physical exercise are suggested as a potential helpful intervention for the school teachers [3, 10].

Literature available through various resources has majorly focused on the WMSDs among school teachers in western countries. There has not been enough focus on the prevalence, factors associated with and effects of neck pain and other WMSDs in India. The teaching style and resource settings for school education are different for Indian school system as compared to the western systems. Also, the school teachers are not sufficiently trained in the methods of balancing work-life balance using various methods to avoid psychological distress and reduce health effects of multitasking under pressure.

This study focuses on finding out the prevalence of neck pain among the school teachers of Surat city and identification of factors affecting the neck pain using online cross-sectional survey method.

Materials & Methods

This online cross-sectional survey was conducted among from 287 school teachers working in various public and private schools within Surat city, using Google form. School teachers who were ready to give voluntary electronic consent were included, whereas teachers with diagnosed musculoskeletal or neuromuscular condition causing neck or shoulder pain e.g., cervical spondylosis, PIVD, trapezitis, etc.; who have history of any trauma to head, cervical spine or shoulder were excluded.

A survey questionnaire was developed based on relevant literature review and input from experts in the field. It included sections on demographics, prevalence, and severity of neck pain, occupational factors, ergonomic practices, lifestyle factors, and psychosocial factors. The questionnaire was then converted to an online form using Google Forms. The questionnaire was pilot-tested among a small sample of school teachers to assess its clarity, comprehensibility, and

completeness. Necessary modifications were made based on the feedback received. The questionnaire was sent to more than 300 school teachers using e-mails and WhatsApp, ensuring confidentiality and anonymity of responses (Figure-1). For any queries or clarifications, contact numbers of researchers were given.

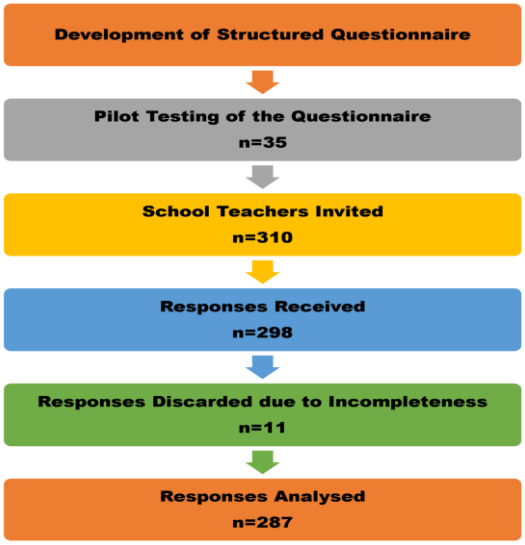

Fig 1: Flow of Participants during Survey

Prior to participation, participants were provided with detailed information about the study objectives, procedures, risks, and benefits, and their electronic consent was obtained. The questionnaire included questions about dependent variable such as prevalence and severity of neck pain; and independent variables such as demographic characteristics (age, gender, education level), neck pain associated symptoms, factors (teaching experience, teaching load, classroom environment), ergonomic practices (posture, workstation setup), lifestyle factors (physical activity, sedentary behaviour), and shoulder pain or associated complaints.

Statistical analysis included descriptive statistics (frequencies, percentages, means, and standard deviations to describe the demographic characteristics of the sample and the prevalence of neck pain; and analytical statistics (regression analysis) to identify factors associated with the prevalence and severity of neck pain.

Results

Demographic distribution of the subjects in the study sample is shown in table 1. Total 287 participants' data were analysed. Mean age of the teachers who responded with completed questionnaire was 44.17 $\pm$ 8.30 years. Mean height and weight for the participants were reported to be 5.45 $\pm$ 0.31 meters and 63 $\pm$ 5.89 kg.

Table 1: Demographic characteristics of participants (n=287)

Sr.	Variable		Frequency (n)	Frequency (%)
1	Gender	Male	125	43.55
		Female	162	56.45
2	Level of Teaching	Higher Secondary	76	26.48
		Secondary	69	24.04
		Primary	72	25.09
		Pre-Primary	70	24.39
3	Teaching Experience	<1 year	56	19.51
		1-5 years	103	35.89
		6-10 years	76	26.48
		>10 years	52	18.12
4	Working Hours per Day	<3 hours	11	3.83
		3-6 hours	156	54.36
		>6 hours	120	41.81
5	BMI Category*	Underweight (<18.5)	23	8.01
		Normal (18.5-22.9)	105	36.59
		Over weight (23-24.9)	77	26.83
		Pre-obese (25-29.9)	39	13.59
		Obese ($\geq$30)	43	14.98

Note:
1. BMI: Bodi Mass Index
2. *: ASIAN Criteria BMI Cutoff (21)

Table 2 shows the details regarding presence, periodicity, severity (at rest and with activity), relation of presence of pain with work, total duration of pain, and aggravating movements.

Table 2: Neck Pain Prevalence & Associated Details (n=287)

Sr.	Item	Responses	Frequency (n)	Frequency (%)
1	Presence of Neck Pain	Yes	126	43.90
		No	161	56.10
2	Periodicity*	Occasionally	53	42.06
		Often	19	15.08
		Sometimes	23	18.25
		Always	31	24.60
3	Severity (Rest)*	>=5	34	26.98
		<5	92	73.02
4	Severity (Activity)*	>=5	57	45.24

		<5	69	54.76
5	Pain Presence*	After Work	48	38.10
		During Work	41	32.54
		All the Time	37	29.36
6	Total Pain Duration*	Weeks	21	16.67
		Months	46	36.51
		More than a Year	59	46.82
7	Aggravating Movements*	Forward Neck Bending	39	30.95
		Backward Neck Bending	33	26.19
		Over Head Activities	47	37.30
		All the Above	51	40.48

Note: *: Here the total number of participants n=126

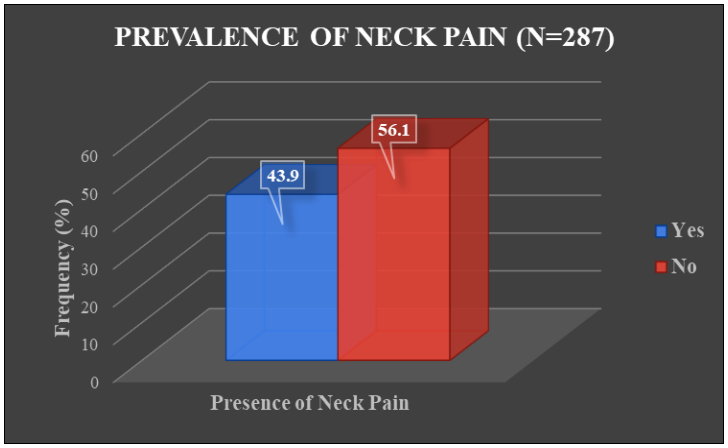

Fig 2: Prevalence of Neck Pain (n=287)

Figure 2 depicts the graphical representation of prevalence of neck pain.

Following table 3 depicts the frequency of various work-related activities causing neck pain among 126 participants.

Table 3: Work related Activities Causing Neck Pain (n=126)

Sr.	Factors at Work	Responses	Frequency (n)	Frequency (%)
1	Duration of Work	<2 hours	29	23.02
		>2 hours	97	76.98
2	Working on Computer/Laptop	Yes	105	83.33
		No	21	16.67
3	Evaluating Assignments/ Answersheets	Yes	94	74.60
		No	32	25.40
4	Writing on the Board	Yes	68	53.97
		No	58	46.03

As shown in table 4 shows the effect of neck pain on the activities of daily living (ADL) for the school teachers. This shows majority (57.94%) had sleep disturbance, and most of teachers responded that their ADL performance was affected due to neck pain. Teachers described that their occupation related work (45.24%) and household chores (42.86%) were affected the most.

Table 4: Effect of Neck Pain on ADL (n=126)

Sr.	ADLs	Responses	Frequency (n)	Frequency (%)
1	Sleep Disturbance due to Neck Pain	Yes	73	57.94
		No	53	42.06
2	Pain affects Performance of ADLs	Yes	78	61.90
		No	48	38.10
3	Activities affected	Dressing & Grooming	32	25.40
		Household Chores	54	42.86
		Social Involvement	24	19.05
		Occupation Related Work	57	45.24
		All	31	24.60

Table 5 shows that, out of 126 teachers, majority preferred only rest (29.37%), only medicine (21.43%) or combination of rest & medicine (19.05%) for their neck pain. Only 3.97% preferred exercise only whereas exercises in combination with either rest or medicines was preferred by total 11.10% respondents showing that respondents did not prefer exercises as the preference for managing neck pain.

Table 5: Preferred Strategies for Neck Pain Management (n=126)

Item	Response	Frequency (n)	Frequency (%)
Preferred Intervention for Neck Pain	Only Rest	37	29.37
	Only Medicine	27	21.43
	Only Exercise	5	3.97
	Rest & Medicine	24	19.05
	Medicine & Exercise	9	7.14
	Rest & Exercise	5	3.97
	None	19	15.08

Logistic regression analysis performed to determine the association of neck pain symptoms with demographic factors and working conditions. Table 6 shows the values and level of significance for them at $p<0.05$. Risk factor analysis using logistic regression model on the cause of neck pain showed statistical significance $\chi 2= 78.196$, $p<0.005$. Females were 3.502 times more likely to exhibit neck pain than males (OR 3.502, 95% CI 1.598-9.221).

Table 6: Logistic regression analysis for variables

Variable	B	Wald	Df	Sig.	Exp (B)	95% CI for Exp (B)	
Age	-0.032	3.057	1	0.079	0.946	0.927	1.002
Gender (1)	1.384	10.224	1	0.001	3.502	1.598	9.221
Level of Teaching		0.610	3	0.729			
Level of Teaching (1)	0.238	0.102	1	0.739	1.286	0.289	6.546
Level of Teaching (2)	0.244	0.361	1	0.648	1.211	0.348	6.765
Level of Teaching (3)	0.475	0.209	1	0.544	1.519	0.305	6.476
Teaching Experience		3.746	3	0.290			
Teaching Experience (1)	0.892	1.979	1	0.159	2.529	0.686	9.167
Teaching Experience (2)	0.236	0.369	1	0.594	1.264	0.578	2.695
Teaching Experience (3)	0.539	2.491	1	0.125	1.703	0.887	3.268
Working Hours per Day		1.329	2	0.703			
Working Hours per Day (1)	-0.846	0.603	1	0.045	2.484	1.078	4.283
Working Hours per Day (2)	0.289	0.304	1	0.587	1.329	0.439	3.456

Discussion

In this study, the presence of neck pain and the factors associated with it were investigated as a primary outcome among teachers of both sexes from schools in Surat city of Gujarat state. The effect of this neck pain on ADL, work related factors connected to neck pain, and preferred mode of management of neck pain were also studied among these teachers.

Authors found very scarce literature that focused on musculoskeletal symptoms, and specific low back, neck and shoulder pain were not focused as primary areas of involvement in most of the studies. Higher prevalence rates of musculoskeletal pain in teachers were observed in studies conducted by Chiu *et al*. (2006) [11] in secondary school teachers in China (Only neck pain); Darwish *et al*. (2013) [12] in female secondary school teachers in Saudi Arabia; Erick and Smith (2014) [13] among school teachers of Botswana; Temesgen *et al* (2019) [3] in Ethiopia (shoulder/neck pain); and Zaheer *et al*. (2013) among university teachers of Lahore, Pakistan [3, 8, 11-13]. However, the studies conducted in Indian peninsula are limited and majorly have focused on the overall musculoskeletal disorders [5, 6, 14].

Analysis of the data obtained from the surveys showed that 43.90% of the participating teachers had experienced neck pain. These results with high prevalence agree with those obtained by various researchers in the previous studies [3, 6, 12, 14]. Saravanana *et al* (2021) reported the prevalence of neck pain to be less while low back was found to be the most affected body site (48.2%), followed by Shoulder (40.2%) and knee (38.4%) [6]. The study by Darwish *et al*., conducted among the secondary school female teachers in the Saudi Arabia, concluded that 42.1% of them reported neck pain, which is very close to the 43.90% reported in our study. The results in the same culture suggest that a few specific factors, such as teaching classes, long work hours, and high levels of perceived stress at work, may have significant effects [12]. Vaghela and Parekh concluded that 74.47% school teacher suffers from the MSDs in that moreover The prevalence upper back pain was 29.97%, and lower back pain was 49.92% [14].

In the current study, neck MSD affected nearly half of Surat School teachers (43.90%). This result was like previous research carried out in Turkey (42.5%, and 41.4%) but lower than Botswana (50.8%), China (48.7%), and Saudi Arabia (47.9%) [11, 13, 15, 16]. 12-month prevalence of neck pain in Iran and China, 61.3% and 66.7%, were reported too high was reported by high school teachers [9, 17]. A relatively higher prevalence of neck pain was reported in a study of teachers in India (73.5%) [18]. This suggest that Indian teachers are prone to higher risk of upper back and shoulder MSD, when compared with their international counterparts.

Another aim of this study was to determine risk factors associated with neck pain among school teachers of Surat. Logistic regression analysis revealed several interesting associations between neck pain and individual, work related, and physical factors. Various studies have enlisted different factors which may be associated with or considered as the risk factors MSDs including neck pain in school teachers. These factors include age, gender, duration of teaching, working hours, recess/rest time, teaching burden, regular or special teaching activities, areas of body, previous injury, awkward position or postures, psychological job demands, supervisor support, etc [1, 7, 9, 10, 19, 20]. Present study showed that female gender is prone to develop neck pain 3.502 times more when compared to the males (OR: 3.502, 95% CI: 1.598-9.221) and the working hours per day by the teachers also influenced their neck pain associated symptoms (OR: 2.484, 95% CI: 1.078-4.283). No other factors were found to have a significant association with the neck pain. These findings are consistent with previous study by Erick *et al* (2014) [13] where female teachers were found to be 1.50 times more likely to experience upper back MSD related symptoms (13). In India, studies by Saravanana M *et al* (2021) and Kataria *et al* (2022) [21] concluded same findings where female gender was found to be associated

with neck and shoulder pain in school teachers [6, 21]. Female teachers appear to consistently report more shoulder and upper back MSD than their male colleagues [15, 17, 22]. A possible explanation for gender differences in the current study could be attributed to the nutritional status, age and teaching experience of female teachers and the level of schools they were teaching at. Erick *et al* (2014) [13] female participants were significantly older than their male counterparts and were employed for longer period than male teachers at their place employment [13]. In present study, such analysis was not done which could have explained the findings.

Previous studies have suggested role of increased workload, suggested by more working hours per day and taking more classes while dealing with regular teaching and other responsibilities are few challenges teachers face which may lead to stress on them [7, 16, 18]. Results of the present study are also in line with these findings suggested by a significant correlation between the working hours per day and neck pain among teachers. This result might be explained by the prolonged standing or sitting, writing on the board, using laptop or computer while in neck flexion, evaluating the assignments or answer sheets with prolonged neck flexion, which could be considered an aggravation factor; while dealing with students during class, teachers often require physical effort or the maintenance of particular postures for an extended period of time just to be on the same level as those students, such as neck flexion or extension when interacting with them [3, 10]. This study largely confirms the findings of earlier research in this field relating the gender and number of classes to the incidence of MSDs, whether in national or worldwide studies [5, 6, 10, 20].

Majority participants, approximately 70%, in the present study reported that their preferred mode of intervention for neck pain is rest with or without medicine. Only around 13% preferred exercise or physiotherapy as their preference along with rest or medicine. These findings were in contradiction with previous study by Saravanan *et al* (2021), where 44.6% of teachers reported taking Physiotherapy as a coping strategy to handle their pain (6). While this shows there is need to explore awareness of physiotherapy, attitude of society moving towards drug free health care, understanding of and utilization of concepts of ergonomics, and importance of need to take sick leaves to avoid worsening or exaggeration of musculoskeletal symptoms for long term care and better outcomes.

More than half of the participants reported that they have complaints of sleep disturbance and difficulties with ADL (57.94% and 61.90% respectively) due to neck pain. 42.86% reported they have problems with their household chores while 45.24% reported they have difficulties with their occupation related work. The results of this study showed that neck pain does not only affect an individual, but also their families, home, and workplace. Being prevented from carrying out normal activities, seeking medical attention, experiencing pain for a number of days, changing jobs/duties because of pain, cutting down activities at home and even being unable to work for several days because of pain are significant outcomes of WMSDs described by various studies [1, 16, 17]. Zaheer *et al* (2013) concluded that neck and/or shoulder pain does affect teacher's life in a negative way and had reduced their interest in communicating and deliver lectures to students and being punctuate for university [8]. From these results it is evident that neck pain negatively affects the wellbeing of teachers and probably the teaching profession itself.

Unavailability of sufficient staff in most of the work setting like schools, leads to increased work load on available teachers. This might increase the load and in turn reduce the time required to recover from the load. Based on the above discussion, it can be concluded that work patterns commonly used in schools needs to be revised based on the difficulties and musculoskeletal issues it can pose to teachers. Prevalence and risk factor perceptions of school teachers as reported in this study can be of significance in understanding and addressing these factors and appropriate measures to prevent and overcome them can be devised based on these results. Since the risk factors for musculoskeletal symptoms can be multifactorial in nature, the results of this present study need to be correlated with all possible mechanisms related to this population and further studies to determine the effectiveness of appropriate ergonomic modifications should be taken into consideration. This should also include involving the administrators as stake holders to understand the musculoskeletal problems of teachers and evaluating their severity on timely basis.

The cross-sectional design of present study limits the ability to establish causal relationship between the variables. Self-reporting bias leading to participants either under or over reporting their neck pain symptoms or other variable of interest may affect the findings, and the findings may not be generalizable to all school teachers outside of Surat city or to other occupational groups. Longitudinal study will help finding out variables of interest and find out their causal relationships. Face-to-face interviews using structured interviews along with in-depth evaluation can provide relatively unbiased details about neck pain and other variables of interest. Larger sample size with inclusion of participants from multiple geographic regions and occupational sub-groups can help make the findings more generalized.

Conclusion

The present study has shown that neck pain is highly prevalent among school teachers in the Surat city of Gujarat state of India. It apparently affects the quality of their lives through impact upon the ADL at home and at work place. The presence of neck pain was positively correlated with female gender and the number of work hours per day. The high prevalence and risk factors among school teachers emphasize the need for implementing different preventative measures, such as promotional campaigns aiming to educate teachers about workplace ergonomics and how to deal with physical and emotional stress, as well as educating decision-makers to reconsider the weekly number of classes assigned to a single teacher and to set a maximum reasonable number of classes per week. Furthermore, early detection programs aimed at screening for common WMSDs in a certain work environment are recommended.

Acknowledgements

None.

References

1. Yue P, Liu F, Li L. Neck/shoulder pain and low back pain among school teachers in China, prevalence and risk factors. BMC public health,2012:12:1-8.

2. Erick P, Smith D. Musculoskeletal disorder risk factors in the teaching profession: a critical review. OA Musculoskelet Med,2013:1(3):29.
3. Temesgen MH, Belay GJ, Gelaw AY, Janakiraman B, Animut Y. Burden of shoulder and/neck pain among school teachers in Ethiopia. BMC musculoskeletal disorders,2019:20:1-9.
4. Kataria J, Sindhu B, Pawaria S. Effect of mechanical neck pain on neck disability and scapula position among school teachers in Delhi and NCR. Int J Pharm Sci Res,2021:12:1260-5.
5. Kataria J, Sindhu B, Pawaria S. Long-Term Effects of Mechanical Neck Pain on School Teacher Scapula Position, Neck Disability, and Quality of Life in Delhi NCR Region. Asian Pacific Journal of Health Sciences,2021:8(3):4.
6. Murugan S, Saravanan P, Avaiya D, Bawa I, Shah C, Vaghasiya E. Prevalence and risk factors for musculoskeletal pain and coping strategies in school teachers. Journal of Ecophysiology and Occupational Health, 2021, 77-82.
7. Zamri EN, Moy FM, Hoe VC. Association of psychological distress and work psychosocial factors with self-reported musculoskeletal pain among secondary school teachers in Malaysia. PloS one,2017:12(2):e0172195.
8. Zaheer A, Jabeen H, Arshad HS. Level of Disability among Teachers of Superior University Lahore with Neck and/or Shoulder Pain. Internationanl Journal of Science and Research,2016:5(6):1203-06.
9. Chiu TT, Lam PK. The prevalence of and risk factors for neck pain and upper limb pain among secondary school teachers in Hong Kong. Journal of occupational rehabilitation,2007:17:19-32.
10. Rottermund J, Knapik A, Saulicz E, Myśliwiec A, Saulicz M, Rygiel KA, *et al*. Back and neck pain among school teachers in Poland and its correlations with physical activity. Medycyna pracy,2015:66(6):771-778.
11. Chiu TW, Lau KT, Ho CW, Ma MC, Yeung TF, Cheung PM. A study on the prevalence of and risk factors for neck pain in secondary school teachers. Public health,2006:120(6):563-565.
12. Darwish MA, Al-Zuhair SZ. Musculoskeletal pain disorders among secondary school Saudi female teachers. Pain research and treatment, 2013, 2013.
13. Erick PN, Smith DR. The prevalence and risk factors for musculoskeletal disorders among school teachers in Botswana. Occup Med Health Aff,2014:2(4):178.
14. Vaghela NP, Parekh SK. Prevalence of the musculoskeletal disorder among school teachers. National Journal of Physiology, Pharmacy and Pharmacology,2018:8(2):197-201.
15. Durmus D, Ilhanli I. Are there work-related musculoskeletal problems among teachers in Samsun, Turkey?. Journal of back and musculoskeletal rehabilitation,2012:25(1):5-12.
16. Korkmaz NC, Cavlak U, Telci EA. Musculoskeletal pain, associated risk factors and coping strategies in school teachers. Scientific Research and Essays,2011:6(3):649-57.
17. Mohammadi G. Musculoskeletal complaints among high school teachers. Journal of Musculoskeletal Research,2013:16(02):1350010.
18. Mariammal T, Amutha Jaisheeba A, Sornaraj R. Occupation influenced physical illness observed among the teachers of Thoothukudi town. Int J PharmTech Res,2012:4(3):1807-11.
19. Almansour AH, Almutairi DS, Alaskar TM, Kalkatawi MS, Aljubair MF, Alotaibi RS, *et al*. Prevalence of low back pain and disability among secondary school teacher in the eastern province of the Kingdom of Saudi Arabia: a cross-sectional analytical study. Frontiers in Public Health,2024:12:1307845.
20. Abdul Rahim AA, Jeffree MS, Ag Daud DM, Pang N, Sazali MF. Factors associated with musculoskeletal disorders among regular and special education teachers: a narrative review. International journal of environmental research and public health,2022:16:19(18):11704.
21. Kataria J, Sindhu B, Pawaria S. Clinical implication of cervical pain on scapula protraction and upward rotation among primary school teacher aged between 25-35 years-A cross sectional Study. International Journal of Life Science and Pharma Research,2022:12(3):L66-72.
22. Fjellman-Wiklund A, Brulin C, Sundelin G. Physical and psychosocial work-related risk factors associated with neck–shoulder discomfort in male and female music teachers. Medical Problems of Performing Artists,2003:18(1):33-41.