

## Occupational health assessment of teachers in selected schools in Vellore district, Tamil Nadu: Role of workplace environment in health

Geetha Mani\*, M. Sughan Balaji, D. Thirunaaukarasu and Roseline Fatima William

Department of Community Medicine, Karpaga Vinayaga Institute of Medical Sciences and Research Centre, GST Road, Chinna Kolambakkam, Palayanoor P.O - 603308, Maduranthagam Taluk, Kancheepuram District, Tamil Nadu, India

Received: 03<sup>rd</sup> March 2019; Revised: 27<sup>th</sup> May 2019; Accepted: 17<sup>th</sup> June 2019; Published: 01<sup>st</sup> July 2019

**Abstract:** *Background:* Safe and healthy workplace contributes to healthy workforce, making workplace environment a priority setting for health promotion. Teachers as part of their job are exposed to various physical and mental health problems. This study was conducted to assess the workplace-related morbidity profile of teachers in selected schools of Vellore district, Tamil Nadu. *Methodology:* A descriptive, cross-sectional study was conducted during February and March 2018 among teachers of selected schools in Ranipet, Vellore district. Schools in Ranipet were enlisted and categorised as primary, middle and higher secondary. One school was randomly selected from each category. All teachers in selected schools were included and administered a pretested, semi-structured questionnaire comprising the following sections: sociodemographic and occupational characteristics, perceptions on physical environment, morbidity profile including Nordic Musculoskeletal Questionnaire and work-related stress scale. *Results:* A total of 104 teachers participated in the study. Musculoskeletal disorders (70.2%) were the commonest morbidity reported followed by respiratory symptoms (48.1%). Eight percent and 74% reported high and moderate stress levels respectively. Three-fourth participants (72.1%) reported loss of workdays due to job-related illness in the past one year. *Conclusion:* The reported burden of workplace-related morbidity was high among teachers. It is imperative that healthful school environment strategies should also focus on teachers to ensure their health and well-being.

**Keywords:** Workplace environment, Work-related morbidity, Health status of teachers, Nordic musculoskeletal questionnaire, Workplace related stress.

### Introduction

An estimated 45% of the world's population contribute to global workforce [1]. A healthy workforce promotes socioeconomic development and reduces poverty, thereby enhancing the opportunities to achieve the Sustainable development goal 8 of providing and sustaining decent work [2]. Occupational risks can present in acute forms such as accidents, injuries, unintentional poisonings and burns as well as chronic diseases including psychological ill-health [2].

An approximate 30 to 50% of workers worldwide experience exposure to hazardous physical, chemical and biological environment apart from unreasonably heavy physical work and poor ergonomic factors. An equal number of people

also report increased psychological burden at work resulting in symptoms of stress and depression [1]. Back pain accounts for 26% of the chronic disease burden due to occupational risks followed by hearing loss (22%) and chronic obstructive pulmonary disease (12%) [2]. Rapid shift in modern working lifestyle in recent years is associated with increasing demands to learn new skills, need to adapt to new types of work, pressure of higher productivity and quality of work, time pressure pointing to the need for priority action in improving both physical and psychosocial environment of workplaces [1].

Safe and healthy workplace contributes to a healthy workforce, making workplace environment a priority setting for health promotion. Teachers carry out the role of

moulding children in their formative years and are an asset to the nation. In recent decades, teaching has become more challenging with multidimensional job responsibilities [3]. Apart from the demands arising from teaching activities, the work characteristics and workplace environment also makes them vulnerable to specific physical ailments and stress [4].

Review of literature reveals notable paucity of studies which comprehensively assess work-related physical and mental health status of teachers. Hence, this study was attempted to assess work-related morbidity profile of teachers in select schools of Ranipet, Vellore district and to identify the role of occupational characteristics.

**Material and Methods**

This was a descriptive, cross-sectional study conducted among teachers of randomly selected schools of Ranipet, Vellore district, Tamil Nadu during the period of February and March 2018. Ranipet is a suburban, industrial town in Vellore district and was chosen for logistic purposes. In the first step, all schools in Ranipet were enlisted and categorised as primary, middle and higher secondary schools.

In the second step, one school was randomly selected from each category (1 primary, 1 middle and 1 higher secondary). All teachers in the selected schools were included as study population and invited to participate in the study. After the purpose and process of the study was explained and written informed consent was obtained from all participants, a pretested, semi-structured, self-administered questionnaire was administered. The questionnaire consisted of the following sections;

- A. Sociodemographic details.
- B. Occupational characteristics including perceptions on physical environment of workplace.
- C. Morbidity profile related to workplace in the past one year.
- D. Workplace Stress Assessment based on Workplace stress survey questionnaire developed by American Institute of Stress [5].
- E. Nordic Musculoskeletal questionnaire [6] to identify musculoskeletal symptoms among study participants in the last 12 months and last 7 days.

- F. Details of absence from work due to any of the above workplace related morbidity.

The collected data was entered in Microsoft Excel 2007 and statistical analysis was performed using Statistical Package for Social Sciences (SPSS) version 23. Qualitative variables such as gender, socioeconomic status and morbidity profile were summarised as frequencies and percentages. Quantitative variables such as age and hours of work were expressed as mean and standard deviation.

*Ethical considerations:* The study was approved by Institutional Ethics Committee and necessary permissions were obtained from school authorities. Written informed consent was obtained from all participants. Complete privacy and confidentiality was ensured.

**Results**

A total of 104 teachers participated in the study. The age of the participants ranged from 25 to 58 years, with a mean of 38.1 years (SD: ± 8.9). Table 1 depicts the distribution of baseline sociodemographic characteristics and occupational characteristics among the study population.

<b>Table-1: Baseline characteristics of study subjects (N=104)</b>		
<b>Variables</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
<b>Sociodemographic characteristics</b>		
<b>Age (years)</b>		
≤ 30	29	27.9
31 to 40	33	31.7
> 40	42	40.4
<b>Gender</b>		
Male	10	9.6
Female	94	90.4
<b>Marital status</b>		
Currently married	86	82.7
Single/ widowed	18	17.3
<b>Type of family</b>		
Nuclear	60	57.7
Joint	44	42.3

Variables	Frequency (n)	Percentage (%)
<b>Educational status of participants</b>		
Undergraduate	41	39.4
Postgraduate	57	54.8
Others	6	5.8
<b>Socioeconomic status (Modified B G Prasad classification) [7]</b>		
Upper class	56	53.8
Upper middle class	36	34.6
Middle class	10	9.6
Lower middle class	2	2
<b>Occupational characteristics</b>		
<b>Teaching experience (years)</b>		
< 5	38	36.5
5 to 10	29	27.9
11 to 20	22	21.2
>20	15	14.4
<b>Classes taught</b>		
Primary grade	40	38.5
Middle grade	32	30.8
High & Higher secondary class	32	30.8
<b>Number of workdays/week</b>		
5	44	42.3
6	60	57.7
<b>Hours of work/day</b>		
≤ 6	16	15.4
7 to 8	77	74
> 8	11	10.6
<b>Commuting time to work</b>		
≤ ½ hour	90	86.5
½ hour to 1 hour	14	13.5
<b>Type of transport to work</b>		
Walking	33	31.7
Two-wheeler	37	35.6
Bus or auto	34	32.7
<b>Hours spent in job-related work at home/ week</b>		
≤ 2 hours	29	27.9
3 to 6 hours	27	26.0
6 to 10 hours	30	28.8
> 10 hours	18	17.3

The study participants spent on an average, 1.74 hours sitting, 2.06 hours standing and 2.07 hours walking on a typical work day. Table 2 reports the perceptions of participants on their physical environment ant work place.

<b>Table-2: Distribution of Perceptions related to physical environment among study participants (N=104)</b>		
Perception on physical environment	Yes (n)	%
The level of noise in the area in which I work is usually high	62	59.6
The level of lighting in the area in which I work is usually poor	15	14.4
The temperature of my work area during the summer is usually comfortable	84	80.8
The temperature of my work area during the winter is usually comfortable	89	85.6
The humidity in my work area is usually either too high or low	55	52.9
The level of air circulation in my work area is good	96	92.4
The air in my work area is clean and free of pollution	71	68.3
In my job, I'm well protected from exposure to dangerous substances	85	81.7
The overall quality of the physical environment where I work is poor	23	22.1
My work area is awfully crowded	36	34.6

Responses to statements on physical environment were scored, with positive perception assigned a score of “1” and negative perception assigned a score of “0”, so that higher the score, more positive the perception about physical environment of the workplace. The mean score was 7.25 (SD ± 1.82). None of the participants reported exposure to tobacco smoke in the workplace. Among the 104 participants, 4 (3.8%) had Diabetes mellitus, 7 (6.7%) had systemic hypertension, 2 (1.9%) had both Diabetic and Hypertension and 3 (2.9%) had Bronchial asthma. One person (1%) had sustained injury

in the past one year. Table 3 shows the distribution of workplace-related morbidity experienced by the participants in the past one year.

**Table-3: Workplace-related morbidity profile of study subjects in past one year (N=104)**

Variables	Frequency (n)	Percentage (%)
Injury	1	1
Respiratory symptoms	50	48.1
Sleep disturbances	12	11.5
Eye strain	29	27.9
Voice strain	29	27.9
Headache	40	38.5
Ear pain or hearing disturbances	11	10.6
Musculoskeletal disorders	73	70.2

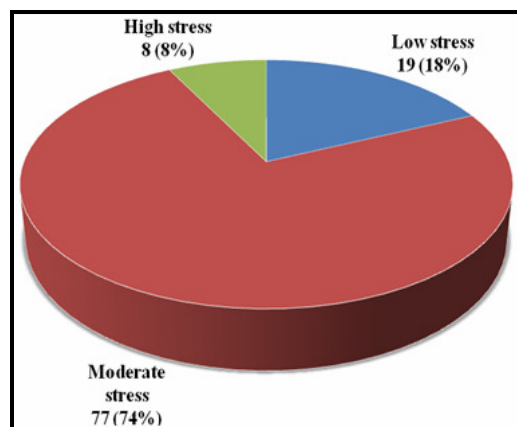
Musculoskeletal symptoms were the most commonly reported morbidity among the study population. Table 4 describes the distribution of musculoskeletal symptoms based on Nordic Musculoskeletal questionnaire.

**Table-4: Distribution of Workplace related musculoskeletal symptoms among study participants based on Nordic Musculoskeletal questionnaire (N=104)**

Musculoskeletal symptoms	Frequency (%) <sup>*</sup>	
	In the last 12 months	In the last 7 days
Neck	39 (37.5)	25 (24)
Shoulders	41 (39.4)	19 (18.3)
Upper back	27 (26)	18 (17.4)
Elbows	20 (19.2)	9 (8.7)
Wrists/ Hands	19 (18.3)	10 (9.6)
Lower back	27 (26)	15 (14.4)
Hips/ Thighs	19 (18.3)	9 (8.7)
Knees	35 (33.7)	23 (22.1)
Ankle/ feet	26 (25)	25 (24)

\*Multiple responses obtained

**Fig-1:** Distribution of Workplace stress score among study participants (N=104)



The mean stress scores of the participants did not differ significantly among sociodemographic and occupational characteristics. Seventy five participants reported absence from work due to job-related illness in the last one year. The number of days of absence due to workplace related morbidity in the past one year among study participants ranged from 1 to 100 days with a median of 5 days. Table 5 categorises the days of absence from work due to workplace related morbidity.

**Table-5: Distribution of days of absence from work among study participants due to workplace-related morbidity in the past 1 year (N=104)**

Days of absence from work	Frequency	Percentage
None	29	27.9
Less than 1 week	39	37.5
1 week to 1 month	32	30.8
More than a month	4	3.8

**Discussion**

A total of 104 teachers participated in the study with 38.5% from primary schools, 30.8% each from middle and higher secondary schools. About 40% of them were above 40 years of age. A predominant proportion of the study population were females (94%). More than half the participants were postgraduates (57%). Dawn et al in their study in West Bengal reported a similar pattern of educational status [8].

More than 50% of the teachers were employed for less than ten years. Sixty participants (57.7%) reported working for 6 days per week and 11% reported working for more than 8 hours per day. An approximate 14% of the population spent more half an hour to one hour in travel to work. Dawn et al in their study found that more than 45% of their participants spent more than one hour to reach school [8]. The distribution of type of commute used by the participants was equal, with one-third using two-wheelers, one-third using buses or autos and another one-third walked the distance to their respective workplaces. Participants spent a substantial part of their time at home in work-related activities; 28.8% of the teachers spent 6 to 10 hours per week and 17.3% spent more than 10 hours. Majority of the participants reported comfortable temperatures at workplace both in summer and winter, good air circulation and clean, pollution-free environment. A high noise level was the commonest workplace environmental problem encountered as reported by the participants (59.6%).

In our study, musculoskeletal disorders (70.2%) were the commonest workplace related morbidity reported, followed by respiratory symptoms (48.1%). Similar high prevalence of musculoskeletal disorders was reported by other authors. Erick et al in their study in Botswana have reported a prevalence of 83.3% of musculoskeletal diseases among teachers and El Gendy et al have reported a prevalence of 96% in Egypt [9-10]. In a study among teachers in Hong Kong by Chong et al the commonest symptoms reported was tiredness (93.4%) and eyestrain (79.9%) [11]. A narrative review by Ng et al identified musculoskeletal disorders to be a significant occupational risk among teachers in Malaysia and they further reported a lack of high quality studies among teachers both in developing and developed world [12].

In our study, 74% of teachers had moderate stress and 7.7% had high stress. In Dawn et al study 26.33% had moderate stress and 12.42% had severe stress [8]. Various other studies have reported an increased proportion of participants with high stress levels compared to our study. Holeyannavar et al, in their study among teachers in Dharwad district, reported moderate stress among 34.3% and high stress among 30.5% teachers [13]. Similar pattern of stress levels was

also observed by Biswas et al in their study among primary school teachers in West Bengal, Sing et al among secondary school teachers in Himachal Pradesh and Hasan A in Haridwar [14-16].

No significant difference was observed in the mean stress scores among different sociodemographic and occupational characteristics of the study participants in our study. Biswas et al observed higher mean scores among males and those with more than 8 years of experience, though the difference was not statistically significant [14]. Dawn et al reported that higher age groups, female gender and increased distance of travel from home were associated with severe stress levels [8]. The varying pattern of stress levels observed among different studies could be attributed to the use of different stress assessment scales in the studies. Most scales which evaluate occupational stress are longer and more applicable for complex organisational set-ups. There is a lack of validated scales for use in Indian workplaces.

The present study reveals that majority of the teachers have experienced at least one workplace-related physical health problem in the past one year and most teachers experienced moderate and high levels of stress due to workplace environment. Our study has few limitations. The Workplace stress survey scale developed by The American Institute of Stress was used in this study considering the simplicity of its use and the applicability of the statements for teachers.

The lack of validated scale for Indian system is a need of the hour. A larger sample size involving more number of schools would provide a clearer picture of the role of occupational environment in the health status of teachers. Nonetheless our study assumes importance in the fact that it is probably the first study to comprehensively assess the physical and mental health of teachers. Though a few authors in India and abroad have focussed on occupational stress of teachers, perceptions of teachers on their physical environment and workplace related physical morbidity and the resultant loss of workdays have rarely been assessed.

## Conclusion

The reported burden of workplace-related morbidity was high among teachers. Teachers are an irreplaceable asset. It is imperative that healthful school environment strategies should also focus on providing and sustaining a healthy work environment for teachers to ensure their health and well-being.

**Financial Support and sponsorship:** Nil

## Acknowledgement

The authors would like to acknowledge the school authorities for their assistance throughout the study and the teachers for their enthusiastic participation.

**Conflicts of interest:** There are no conflicts of interest.

## References

- World Health Organization. Occupational health. Global strategy on occupational health for all: the way to health at work. [Accessed on February 28, 2018]. Available at [https://www.who.int/occupational\\_health/publications/globstrategy/en/index1.html](https://www.who.int/occupational_health/publications/globstrategy/en/index1.html)
- World Health Organization. Contribution of the worker's health to SDGs- Fact sheet. Dated 29 January 2019. Available at <https://www.who.int/sustainable-development/SDG-Factsheets-Workers-med-res-20718b.pdf> [Accessed on February 20, 2019].
- Hasan A. A study of occupational stress of primary school teachers. *Educationia Confab*. 2014; 3(4):11-19.
- Kovess-Masfety V, Sevilla-Dedieu C, Rios-Seidel C, Nerriere E, Chee CC. Do teachers have more health problems? Results from a French cross-sectional survey. *BMC Public Health*. 2006; 6:101.
- American Institute of Stress. The Workplace Stress Scale. Available at <https://teorionline.files.wordpress.com/2011/04/unit-3-the-workplace-stress-scale.pdf> [Accessed on January 20th 2018].
- Crawford JO. The Nordic Musculoskeletal Questionnaire. *Occupational Medicine*, 2007; 57(4): 300-301.
- Tabassum N, Rao RLL. An update on B.G. Prasad's socio-economic classification. *Journal of Medical Pharmaceutical and Allied Sciences*, 2017; 3:667-673.
- Dawn S, Talukdar P, Bhattacharjee S, Singh OP. A study on job related stress among school teachers in different schools of West Bengal, India. *Eastern Journal of Psychiatry*, 2016; 19(1):12-17.
- Erick PN, Smith DR. The Prevalence and Risk Factors for Musculoskeletal Disorders among School Teachers in Botswana. *Occup Med Health Aff*. 2014; 2:4.
- El Gendy M, Korish MM. Work related musculoskeletal disorders among preparatory school teachers in Egypt. *Egyptian Journal of Occupational Medicine*, 2017; 41(1):115-126.
- Chong EYL, Chan AHS. Subjective health complaints of teachers from primary and secondary schools in Hong Kong. *International Journal of Occupational Safety and Ergonomics*, 2010; 16(1):23-39.
- Ng YM, Ibrahim N, Maakip I. Prevalence and risk factors of musculoskeletal disorders (MSDs) among primary and secondary school teachers: A narrative review. *Austin Journal of Musculoskeletal disorders*. 2017; 4(2):1046.
- Holeyannavar PG, Itagi SK. Stress and health status of primary school teachers. *Karnataka J. Agric. Sci*. 2010; 23(4):620-624.
- Biswas M. A study of occupational stress in new set up primary school teachers in Murshidabad district in West Bengal. *International Education and Research Journal*, 2017; 3(10):71-73.
- Sing N, Katoch A. Study of occupational stress among secondary school teachers. *International Journal of Advanced Education and Research*, 2017; 2(4):28-31.
- Hasan A. A study of occupational stress of primary school teachers. *Educationia Confab*, 2014; 3(4):11-19.

**Cite this article as:** Mani G, Sughan Balaji M, Thirunaaukarasu D and William RF. Occupational health assessment of teachers in selected schools in Vellore district, Tamil Nadu: Role of workplace environment in health. *Al Ameen J Med Sci* 2019; 12(3):139-144.

This is an open access article distributed under the terms of the Creative Commons Attribution-Non Commercial (CC BY-NC 4.0) License, which allows others to remix, adapt and build upon this work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

\*All correspondences to: Dr. Geetha Mani, Associate Professor, Department of Community Medicine, Karpaga Vinayaga Institute of Medical Sciences and Research Centre, GST Road, Chinna, Kolambakkam, Palayanoor P.O-603308, Maduranthagam Taluk, Kancheepuram District, Tamil Nadu, India E-mail: drgeethamm@gmail.com