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Ergonomics Study of the Incidence of Musculoskeletal Disorder among the School Teachers in Egba Division of Ogun State Nigeria

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Abstract

Musculoskeletal pains (MP) especially the lower back, leg, neck and shoulder pain were the common complain among the classroom teachers due to prolong desk working and standing in the classroom. The study was conducted among the primary and secondary school classroom teachers in randomly selected two hundred and seven (207) schools in Egba division of Ogun State, Nigeria. Four thousand five hundred (4,500) modified Nodic Musculoskeletal disorders (MSDs) questionnaires were administered to the classroom teachers to assess their body parts with MSDs and their perceptions on health risk at work but four thousand and sixty (90.2%) participated. The analysis of the study revealed that the total prevalence of MSDs is 70.47%. The result showed that 65.2%, 18.9%, 11.7%, 3.2% and 1.1% of the teachers complained of leg pain (LP), lower back pain (LBP), shoulder pain (SP), Neck pain (NP) and upper back pain (UBP) respectively. The result further revealed that 49.7% of the teachers activated rest or sleep as a way of treatment of their nursing pains. Only 33.6% visit the hospital or clinic while 14.8% and 2.2% indulged in self-medication or otherwise. The results further showed that the classroom teachers are affected by work-related MSDs and that they represent an occupational group with high prevalence of MP. The result concluded that strategies are needed to be developed to reduce the MP in teachers.

1. Introduction

Musculoskeletal disorders (MSDs) were defined as perceived inflammatory and degenerative conditions involving tendons, muscles, ligaments etc [1]. Musculoskeletal disorders (MSDs) have also been recognized as a considerable problem in the teaching profession and various risk factors have also been documented [2]. Musculoskeletal complaints, especially of the lower back, neck and shoulders, are also common among teachers due to prolonged desk work, prolonged standing

in class and repetitive overhead writing on the board, prolonged sitting resulting from frequent reading [3].
Teacher's work does not centre only on teaching of students but preparing lessons, assessing students' work and involved in extracurricular activities such as sports. Teachers do participate in different school and community activities. For effective functioning of the educational system and improving the quality of learning processes, teachers are key factor [1], [2]. In some schools, teaching activities is done under unfavourable conditions, in which teachers must utilize their physical, cognitive and effective capability to reach a teaching objective, over demanding or generating effort to their psycho-physiology functions.

Erick and Smith [2] critically analysed the literature and report on the possible associated risk and protective factors among teachers. This review focused on primary and secondary teachers aimed to identify all articles that reported MSD risk factors among teachers. The work tasks of school teachers often involves significant use of a 'headdown' posture, such as frequent reading, marking of assignments and writing on a blackboard [4].

2. Methodology

A cross sectional study was conducted among primary and secondary school teachers in randomly selected schools in Egba division (Abeokuta North and South, Ewekoro, Ifo, Odeda and Obafemi-Owode Local government area) of Ogun State. Two hundred and seven (207) schools were randomly selected from the pool of schools obtained from Egba division. Four thousand, five hundred (4,500) questionnaires were administered randomly to the selected teachers while four thousand and sixty (4,060), 90.2% teachers participated with returned and completed questionnaire.

A modified Nodic Musculoskeletal disorders questionnaire (NMQ) was used to assess the body parts with musculoskeletal disorders and their perceptions on health risk at work. The questionnaire was designed to include i) Demographical variables, ii) teaching history, iii) medical history with possible associated occupational risk factors such as lower back pain (LBP), upper back pain (UBP), leg pain (LP), shoulder pain (SP) etc.

The collected data were analyzed using SPSS 23version accordingly. Descriptive analyses were performed on categorical variables (summarised as percentages). Subjects were calculated to characterize the study population including age group differences, duration of work, hours of work and health issue. Percentage value on prevalence of LBP, UBP, LP and SP were calculated.

Figures 1- 6 shows the pictures of some classroom activities by teachers.

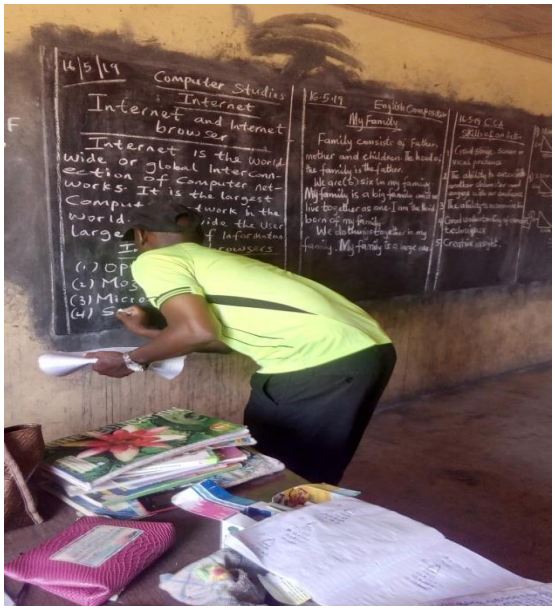

Figure 1: Teacher in awkward position

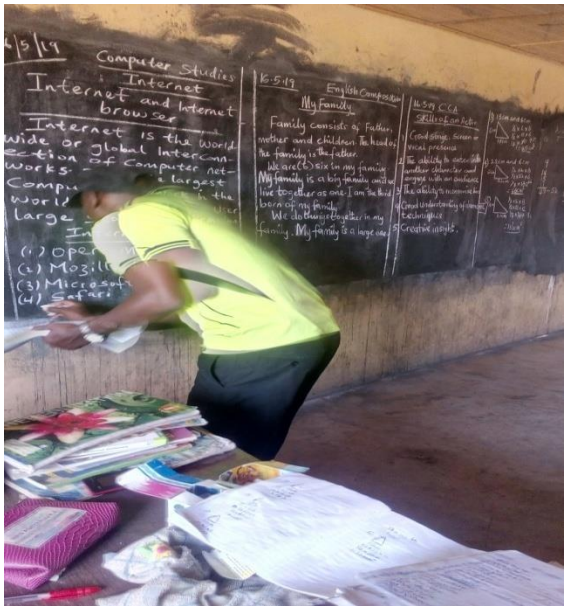

Figure 2: Teacher is a flexion position

Figure 3: Teacher in 125^0 position on a relax mood of back pain

Figure 4: Teacher in a standing position to relax leg pain and back pain

Figure 5: Teacher preparing lecture note

Figure 6: Teacher recording students assignment scores while seated.

3. Results and Discussion

The results showed that the response rate of the participated teachers that completed and returned the questionnaire was 90.2% (4,060 of the 4,500).

Table 1: Gender

Sex	Frequency	% respondents
Male	1919	47.3
Female	2141	52.7

Table 2: Age group

Age (years)	N	% respondents
20 – 25	388	9.6
26 – 31	171	4.2
32 – 37	1710	42.1
38 – 44	974	24.0
45 – above	817	20.1

Table 3: Marital Status

Marital status	N	% respondents
Married	2516	62.0
Single	1156	28.5
Divorcee	388	9.6

Table 4: Education level

Education	N	% respondents
Secondary school	131	3.2
Bachelor Degree/HND//NCE	3676	80.5
Postgraduate	253	6.2

Table 5: Have you worked in any school

	n	% respondents
Yes	3848	94.8
No	212	5.2

Table 6: How long have you been in teaching profession

Years	n	% respondents
0 – 5	469	11.6
6 – 10	1748	43.1
11 – 15	1028	25.3
16 – above	815	20.1

Table 7: How long do you work in school (working hours)

Time	n	% respondents
Less than 8 hours	1744	43.0
Always 8 hours	986	24.3
More than 8 hours	1330	32.8

Table 8: How long do you sit in classroom/office

Time	n	% respondents
Less than 8 hours	2641	65.0
Always 8 hours	775	19.1
More than 8 hours	644	15.9

Table 9: Perception pains

		N	% respondents
Do you experience any lower back pain (LBP)	Yes	2138	52.7
	No	1922	47.3
Are you suffering from any leg pain (LP)	Yes	2437	60.0
	No	1623	40.0
Do you experience any upper back pain (UBP)	Yes	3329	82.0
	No	731	18.0
Do you experience any pains in your shoulder (SP)	Yes	2816	69.4
	No	1244	30.6
Do you experience any pain in the neck (NP)	Yes	3586	88.3
	No	474	11.7

Table 10: Which pains are you nursing or treated

	n	% respondents
NP	130	3.2
LBP	766	18.9
LP	2646	65.2
SP	474	11.7
UPB	44	1.1

Table 11: What type of treatment do you normally get

	n	% respondents
Visit to Clinic	1364	33.6
Rest/Sleep	2009	49.5
Self Medication	599	14.8
Others	88	2.2

Table 12: Does your work require extended reaches beyond normal time

	n	% respondents
Yes	2529	62.3
No	1531	37.7

Table 13: Is the workspace available for you is sufficient

	n	% respondents
Yes	2693	66.3
No	1367	33.7

Table 14: Does the work allow the use of any support

	N	% respondents
Yes	2175	53.6
No	1885	46.4

The analysis of the study revealed that the total prevalence of the MSDs is 70.47% among the classroom teachers. MSDs in the school can be due to several factors such as high physical workload, long working hours, job demand-support imbalance, lack of educational resources and awkward posture [5].

Table 2 showed that age group of the participant was high between 32 – 37years (42.1%, n = 1710) while minority occurred between 26 – 31years age group (4.2%, n = 171). Similarly, there was even distribution of participated school teachers between 34 – 44years (24.0%, n = 974), 45 – years above (20.1%, n = 817) and 20 – 25years (9.6%, n = 388) age group respectively. However, most of the teachers 62.0% were married with 9.6% as Divorcee (Table 3). The study identified that prolong hours, specific sitting postures with a sudden change could resulted to prevailing MSDs [6].

In total MSDs, leg pain (LP) was badly affected with 65.2% of classroom teachers, 18.9% low back pain (LBP), 11.7% shoulder pain (SP), 3.2% Neck pain (NP) and 1.1% upper back pain respectively (Table 10). The findings are much lower than that reported by Turkish study of prevalence rate of 42.5% NP, 28.7% SP and 43.8% LBP respectively [7].

The lower prevalence observed in the teachers might be related to the decrease job demand and climatic condition of Nigeria. This study revealed that most of the teachers were suffering from one or more musculoskeletal pains.

The descriptive analysis also revealed that 49.5% (n = 2009) school teachers resulted to having rest or sleep as a way of treatment for their nursing pains. Only 33.6% (n = 1364) do visit the hospital or clinic while 14.8% (n = 599) and 2.2% (n = 88) indulged in self-medication or otherwise.

The results obtained showed that the school teachers are affected by work-related MSDs and that they represent an occupational group with a high prevalence of musculoskeletal pain (MP). Similarly, the study showed that majority of the teachers worked six to eight hours on school days and reported that their job demand necessitates prolong standing more than half of the working hours. It was revealed in the study that 62.3% of the teachers stayed back in classroom beyond their normal closing hour either for official or personal work. Some of them resulted to have rest after the daily activities.

However, 53.6% of the teachers agreed to the use of support such as equipment/teaching resources. The disorder is one of the leading causes for ill health retirement among the school teachers. The nature of job of school teachers involved a lot of head down postures, reading, correction of assignment and writing on the board, standing up teaching in class, overhead writing on the board and also unsafe act discovered in teachers [8].

This study revealed considerably prevalence of disorder reported in the leg and shoulder extremities but also in neck and back extremities [4]. Most school teachers are predisposed to musculoskeletal pains since the bulk of their time is spent working or standing. International Labour Organization (ILO) recommended 25 students per class because this scenario directly influences the quality of teaching, leading to worse learning condition and health hazards to teachers [8].

The school furniture also associated with musculoskeletal pain. Musa and Ismaila [9] reported that lack of or inappropriate ergonomically designed classroom chairs and tables may develop positions unfavorable to the musculoskeletal system for teachers such as sitting without back support with excess flexion of knee and hips and flexion of the trunk to write and read text on the table. Evidence suggests that musculoskeletal pains were due to minimum work place support and low job satisfaction. Physical exertions during teaching prolong standing inappropriate way for several hours in the classroom resulted in musculoskeletal pains among teachers.

4. Conclusion

This study shows that most teachers leaving around the Egba area of Ogun State have high prevalence of musculoskeletal pains. Strategies need to be developed to reduce the prevalence of the musculoskeletal pain in teachers. These strategies include educating the teachers on the MSDs, ergonomics and appropriate postures. It is suggested that further research targeting various occupational activities with the teaching community to provide wide information on MSD from a wider representation of teachers be done. Also, further studies can be performed to determine the effectiveness of ergonomics in school teachers and effect of health education and promotion programs among the teachers to encourage maintaining ideal weight and wearing flat medical shoe to reduce the MSD in school teachers.

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