

Correlates of Occupational Health Hazards among Secondary School Teachers in Yenagoa Local Government Area of Bayelsa State

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Abstract

The study investigated correlates of occupational health hazards among secondary school teachers in Yenagoa Local Government Area of Bayelsa State. Survey design was adopted, and a sample of 258 secondary school teachers was used. A questionnaire titled "Questionnaire on Occupational Health Problems Prevalent among Teachers" (QOHPPT) was used to gather data. Four questions and four hypotheses guided the study. Frequencies and mean were used to answer the questions, while the hypotheses were tested with independent sample t-test and ANOVA at 0.05 alpha level. Results reveal that female teachers suffered higher prevalence of voice problems, even as gender does not significantly influence prevalence of voice problems. Age significantly influenced prevalence of voice problem. Female teachers have a higher prevalence of musculoskeletal pains; however gender does not significantly influence prevalence of musculoskeletal pains. Older teachers experience higher prevalence of musculoskeletal pains, even though age does not significantly influence prevalence of musculoskeletal pains among secondary school teachers. Based on the findings, recommendations were made including that the ministry of education should introduce the use of public address system to reduce stress on the voice.

Keywords: Occupational, health, hazards, teachers, gender, age

Introduction

Teachers are laden with the responsibility of moulding characters that become future leaders, who in future contribute to the meaningful development of the society. Some of the hazards prevalent among teachers include vocal problems, respiratory, physical and psychological problems as stated by Ramprasad, Das and Maruthi (2014). Sherman (n.d) reveals that it is certain that teachers are at risk for some kind of injuries in the course of performing their duties; working with the computer, writing (making notes, marking, copying note on the board) with the hand and wrist can cause stress injuries. Back pain, hip or leg problem can arise from regular standing in the class to teach.

Occupational health takes care of health related issues and safety in workplaces. It is primarily concerned with how to ensure that hazards are prevented; to see to how

workers' lives are safe and to prevent all forms of physical, emotional, psychological and health challenges as much as possible. Certain factors, including physical, biological, chemical, social and psychological factors, which are present at workplaces and encountered by workers, are the causes of occupational or workplace diseases. The American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS) in Johns Hopkins Medicine (2013) reports that about 47% of teachers suffer some degree of voice abnormality. The reason cannot be farfetched; professionals who use their voice as a professional instrument, more frequently, are prone to voice disorders; teachers amongst others in this group present a higher prevalence of voice changes.

Due to the inestimable work teachers carry out selflessly to mould lives of youths to become future leaders in the society, they are regularly exposed to certain health issues placed upon them as a result of the occupation in which they find themselves. It has become a common experience to hear teachers complaining of certain common health-related issues; such as voice disorders, chest pain and other musculoskeletal disorders such as neck pain, shoulder pain, back pain, waist pain etc. Are these complaints common to all categories of teachers? This study set out to ascertain how gender and age of secondary school teachers influence these occupational health disorders. The variables of the study are (gender and age as independent variables and voice disorders and musculoskeletal pain as dependent variables.

WHO and ILO, in Zadeh and Fakhri (2011) views occupational health as the science and the art of providing employees with the highest rate of health, maintaining high quality, and enhancing the health of work force. Ontario Ministry of Labour (2015) asserts that occupational illness is a condition whereby a worker's normal physiological mechanisms are affected and his health impaired as a result of being exposed to some physical, chemical, or biological agents. Occupational illnesses usually develop over a long period of time as a result of the conditions at the workplace. Such conditions include being exposed to disease-causing bacteria and viruses, exposure to chemicals or dust. Occupational health hazard is defined by howMed (2013) as "a situation with a potential for harm in terms of injury or ill health, damage to property, damage to workplace environment or a combination of these."

On the prevalence of musculoskeletal pains, Solis-Soto, Schon, Soliso-Soto, Parra and Radon (2017) ascertained that the prevalence of musculoskeletal disorders (MSD) is high among school teachers. Vaghela and Parekh (2017) found that total prevalence of the MSDs among teachers is 74.47%. On the prevalence of voice problems, Hamid, Eldessouky, Iskender and Hassan (2014) ascertained that prevalence of dysphonia was 23.2% among teachers. Abbaszadeh, Jahangiri and Hassanipour (2019) found out that there was 56% prevalence of voice disorder. Many studies have been carried out concerning gender and musculoskeletal pains; Erick and smith (2014) found out that female teachers experienced higher pain intensity in the shoulder than their male

counterparts. Vaghela and Parekh (2017) and Ojoawo and Orakwue (2016) reported high prevalence of work related musculoskeletal pain among female teachers than males. The studies of El Gendy and Korish (2017) and Cardoso, Ribeiro, Araújo, Carvalho and Reis (2009) revealed that the prevalence of musculoskeletal disorder was significantly higher among females compared to males. Studies have been carried out concerning age and prevalence of musculoskeletal pains with contrary findings. With reference to age group, an increase in musculoskeletal pain (MSP) with age was observed in the study conducted by Cardoso, Ribeiro, Araújo, Carvalho and Reis (2009). El Gendy and Korish (2017) reported that the work related musculoskeletal disorders had no relationship with age. Shyam and Dutt (2017) verified that older workers suffered more musculoskeletal pains. They also ascertained that age was statistically significant.

There are series of studies carried out on the relationship between gender and voice problems. Houette, Claeys, Wuyts and Lierde (2012) and Sebastian, Suresh, Simon and Ballraj (2013) reported that women had higher voice disorders than men. The studies of Smith et.al in Williams (2003) and Nerrière, Vercambre, Gilbert and Kovess-Masféty (2009) verified that more female teachers reported of voice disorders than the males. Angelillo, Di Maio, Costa, Angelillo and Barillari (2009) and Roy, Merrill, Thibeault, Parsa, Gray and Smith (2004) verified that female teachers have a higher lifetime prevalence of voice disorder than their male counterparts. The prevalence of voice disorder has been ascertained to be higher among female teachers than male teachers (Assuncao, Bassi, de Medeiros, Rodrigues & Gama, 2012; Alva, Machado, Bhojwani & Sreedharan, 2017; Pizolato, Mialhe, Cortellazzi, Ambrosano, Rehder & Pereira, 2013; Marcal & Peres, 2011). Studies on age and voice problems are quite scanty. Akinbode, Lam, Ayres and Sadhra (2014) verified that no significant association exists between voice disorder and age.

Previous studies reveal a higher prevalence of musculoskeletal and voice pains among female teachers, and higher prevalence of musculoskeletal pains among older teachers. These findings stirred up the researcher to carry out similar study in Yenagoa Local Government Area of Bayelsa. Studies on prevalence of musculoskeletal and voice pains in Yenagoa are scarce, and studies on relationship between age and prevalence of musculoskeletal and voice pains are scarce. This investigation became necessary to verify how gender and age will correlate with prevalence of musculoskeletal pains and voice problems among secondary school teachers in Yenagoa Local Government Area of Bayelsa State.

Research questions

The study was guided by the following research questions:

1. What is the difference in prevalence level of voice problems in relation to gender?
2. To what extent does the prevalence of voice problems differ according to age?

3. How does gender influence prevalence of musculoskeletal disorder among teachers?
4. To what extent does the prevalence of musculoskeletal pain differ among teachers of different age groups?

Hypothesis

Ho1 There is no significant gender difference in the prevalence of voice problems among secondary school teachers in Yenagoa Local Government Area.

Ho2 There is no significant age difference in the prevalence of voice problems among teachers.

Ho3 There is no significant difference in the prevalence of musculoskeletal pains among teachers in relation to gender.

Ho4 There is no significant difference in the prevalence of musculoskeletal pains among secondary school teachers with relation to age.

Methodology

The study adopted descriptive survey design. This design was deemed appropriate for the study because its focus was to investigate a phenomenon that has already occurred, upon which the researcher had no influence. This agrees with the assertions of Kothari and Gaurav (2016) that the main purpose of descriptive research is to describe the state of affairs as it presently exists and that the researcher has no control over the variables; he can only report what is happening. The target population of the study comprised of all secondary school teachers in Yenagoa Local Government Area of Bayelsa State. The convenience sampling technique was adopted, as only teachers that accepted to fill the questionnaires were selected; this sampling technique became necessary as a result of uncooperative attitude of some teachers. Kothari and Gaurav (2016) assert that “when population elements get selected to be included in a sample on the basis of ease of access, it can be referred to as convenience sampling”. Four hundred copies of the questionnaire were distributed, but two hundred and fifty-eight workable questionnaires were used for analysis (questionnaires with incomplete filling were discarded).

An instrument titled “Questionnaire on Occupational Health Problems Prevalent among Teachers” (QOHPPT) developed by the researcher was used for data collection. It contains two sections; Section A contained demographic variables, while section B comprised of fourteen (14) items with likely health problems that are prevalent among teachers. The respondents were required to respond to the items on the QOHPPT on a four-point Likert scale ranging from strongly agree to strongly disagree; representing SA-4, A-3, D-2 and SD-1. The least obtainable score is 14, while the highest is 56. In determining the level of prevalence of musculoskeletal pain or voice problem, mean values were used. The validity of the instrument was done by two Measurement and Evaluation experts. The reliability of the instrument was analysed using the split-half method and the reliability co-efficient was .73. For the purpose of answering the questions, and testing the hypotheses, the Statistical Package for Social Sciences (SPSS)

was used for analyses. Descriptive statistics such as frequencies, mean, and percentages were applied to answer the research questions. Hypotheses 1 and 3 were tested using independent sample t-test, while Analysis of Variance (ANOVA) was adopted to test hypotheses 2 and 4.

Presentation of results

Question 1: What is the difference in prevalence level of voice problems in relation to gender?

Table 1: Descriptive Statistics for gender and prevalence of voice pain

Gender	N	Mean	Std. Deviation
Males	112	4.7679	1.33546
Females	146	5.0205	1.47844

Table 1 show that female secondary school teachers with a mean of 5.02 suffer more voice problems than male teachers, whose mean is 4.77. Males are 112, representing 43.4%, while females are 146 representing 56.6%.

Ho1: There is no significant gender difference in the prevalence of voice problem among teachers.

Table 2: t-test analysis of no significant influence of gender on prevalence of voice problem

Gender	N	Mean	df	Mean difference	t-value	Sig (2-tailed)	Remark
Male	112	4.77					
Female	146	5.02	256	-0.25	-1.418	.157	NS(Not sig)

The t-test statistics reveal that there is no significant difference in the prevalence of voice problem between male and female teachers. The result shows p-value of .157 for voice problem which is higher than alpha level of .05. Hence, the hypothesis that there is no significant gender difference in the prevalence of vocal problem among secondary school teachers in Yenagoa L. G. A. is retained.

Question 2: To what extent does the prevalence of voice disorder differ according to age?

Table 3: Descriptive statistics of age and voice problem

Age	N	Mean	Std. Deviation
Below 30	58	4.5000	1.53611
31-40	93	4.9462	1.55595
41-50	92	5.1739	1.16363
51 and above	15	4.6667	1.23443
Total	258	4.9109	1.42101

Table 3 shows that teachers within age range of 41-50 have a higher prevalence of voice disorder with a mean 5.17, followed by those of 31-40 years of age with a mean of 4.95. Teachers above 50 years have a mean of 4.67 and those less than 30 years have the least prevalence with a mean of 4.50. Teachers below 30 years are 58, representing 22.5% of the sample, those of 31-40 are 93 (36%), 41-50 are 92 (35.7%) and those more than 50 years are 15 representing 5.8%.

Ho2: There is no significant age difference in the prevalence of voice problem among teachers.

Table 4: ANOVA of age and voice problems

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	17.168	3	5.723		
Within Groups	501.782	254	1.976	2.897	.036
Total	518.950	257			

The result on table 4 above shows that the computed F (2.897) is statistically significant as the P of .036 is less than alpha of 0.05; therefore the null hypothesis that there is no significant age difference in the prevalence of voice problem among teachers is rejected ($F(3, 254) = 2.897, p < .05$). This implies that age has significant influence on prevalence of voice problem among secondary school teachers.

Question 3: How does gender influence prevalence of musculoskeletal pains among teachers?

Table 5: Descriptive Statistics for gender and musculoskeletal pains

Gender	N	Mean	Std. Deviation
Males	112	12.6875	3.09033
Females	146	13.3082	3.37652

Table 5 reveals that female secondary school teachers with a mean of 13.31 have a higher prevalence of musculoskeletal pains than their male counterparts who have a mean of 12.69. Male teachers are 112, representing 43.4%, while females are 146 representing 56.6%.

Ho3: There is no significant gender difference in the prevalence of musculoskeletal pains among teachers.

Table 6: t-test analysis of influence of gender on prevalence of musculoskeletal pains

Gender	N	Mean	df	Mean difference	t-value	Sig (2 tailed)	Remark
Male	112	12.69					
Female	146	13.31	256	-0.62	-1.518	.130	NS (Not sig)

The t-test statistics reveal that there is no significant difference in the prevalence of musculoskeletal pain between male and female teachers. The result shows p-value of .130 for musculoskeletal pain which is higher than alpha level of .05. Hence, the hypothesis that there is no significant gender difference in the prevalence of musculoskeletal pain among secondary school teachers in Yenagoa Local Government Area is retained.

Question 4: To what extent does the prevalence of musculoskeletal pain differ among teachers of different age group?

Table 7: Descriptive statistics on age and prevalence of musculoskeletal pains

Age	N	Mean	Std. Deviation
Below 30	58	12.6724	3.84976
31-40	93	12.7742	3.51744
41-50	92	13.4457	2.62433
51 and above	15	13.6000	2.58567
Total	258	13.0388	3.26377

Table 7 reveals that teachers more than 50 years with a mean of 13.60 have higher prevalence of musculoskeletal pains than others. Age range of 41-50 has a mean of 13.45, 31-40 (12.77) and teachers below 30 years have the least prevalence with a mean of 12.67. Teachers below 30 years are 58, representing 22.5% of the sample, those of 31-40 are 93 (36%), 41-50 are 92 (35.7%) and those more than 50 years are 15 representing 5.8%.

Ho4: There is no significant difference in the prevalence of musculoskeletal disorders among secondary school teachers with relation to age.

Table 8: ANOVA of prevalence of age and musculoskeletal

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	34.250	3	11.417		
Within Groups	2703.362	254	10.643	1.073	.361
Total	2737.612	257			

The result on table 8 shows that the computed F (1.073) is not statistically significant as P of .361 is greater than alpha of 0.05; the null hypothesis that there is no significant age difference in the prevalence of musculoskeletal pain among teachers is retained (F (3, 254) = 1.073, $p > .05$). Hence, age has no significant influence on prevalence of musculoskeletal pain among secondary school teachers.

Discussion of findings

The findings of the study revealed that female secondary school teachers in Yenagoa Local Government Area suffer higher prevalence of voice problem. But the t-test analysis ascertained that there is no significant gender difference in the prevalence of voice problems among secondary school teachers. These findings agree with Houette, Claeys, Wuyts and Lierde (2012), Roy, Merrill, Thibeaut, Parsa, Gray and Smith (2014), Nerriere, Vercambre, Gilbert, and Kovess-Masfety (2009), Sebastian, Suresh, Simon and Ballraj (2013). The prevalence of voice problem being more on women may be as a result of their fragile nature.

On age and prevalence of voice problem, the result shows that teachers within age range of 41-50 (mean of 5.17) and age range of 31-40 (mean of 4.95) had higher prevalence of voice problem than other age groups, and teachers below 30years with mean of 4.50 had the least prevalence. The result also revealed that there is a statistically significant age difference in the prevalence of voice problem. This finding is in contrast with the finding of Akinbode, Lam, Ayres and Sadhra (2014) who found no significant association between age and prevalence of voice disorder.

Female teachers were found to have a higher prevalence of musculoskeletal pains than their male counterparts, with mean of 13.31 for females as against 12.69 for males. It was also ascertained that there was no significant gender difference in the prevalence of musculoskeletal pains among secondary school teachers in Yenagoa L.G.A. These findings are in agreement with Erick and Smith (2014), Cardoso, Ribeiro, Araujo, Carvalho and Reis (2009), and Vaghela and Parekh (2017). Female teachers having a higher prevalence can be attributed to their roles as females; working at home (house chores) and combining it with work at place of work can be a factor.

Secondary school teachers above 50years with a mean of 13.60 had a higher prevalence of musculoskeletal pain, where 41-50 had a mean of 13.45, 31-40, mean of 12.77 and <30, mean of 12.67, showing that older teachers experience higher prevalence of musculoskeletal pains. It was verified that age has significant influence on prevalence of musculoskeletal pains among secondary school teachers in Yenegoa L.G.A. This finding is in line with the studies of Cardoso, Ribeiro, Araujo, Carvalho and Reis (2009), and Shyam and Dutt (2017) who found older workers as having higher prevalence of musculoskeletal pains. The findings however disagree with El Gendy and Korish (2017) who found that musculoskeletal disorder has no significant relationship with age.

Conclusion

Based on the findings and discussions, it can be concluded that secondary school female teachers in Yenagoa Local Government Area of Bayelsa State have a higher prevalence of both voice problems and musculoskeletal pains. It is evident that older teachers have a higher prevalence of musculoskeletal pains and voice problems.

Recommendations

Based on the findings, the researcher made the following recommendations:

1. The government and the ministry of education should make plans and establish more schools, so as to depopulate overpopulated schools, as this will go a long way to alleviate the health related issues that arise from teachers having to place extra pressure on their voices to reach out to the students in an overpopulated classroom.

2. The introduction of public address system in our classrooms will go a long way to help teachers teach their students without having to put much pressure on their vocal cords while teaching.

3. More teachers should be employed, so that the workload is distributed across sufficient teachers, to reduce burden on the teachers, especially where teachers are expected to carry out proper continuous assessment.

4. The teachers should be provided with adequate and comfortable furniture, for sitting and writing, to aid proper sitting posture to reduce musculoskeletal pains.

Reference

- Abbaszadeh, S., Jahangiri, M. & Hassanipour, S. (2019). Work-Related Health Problems among Primary and Secondary School Teachers: A Cross-Sectional Study. *Shiraz E-Medical Journal*, 20(6), 1-8. Retrieved on July 22, 2019 from <http://emedicalj.com/en/articles/83771.html>
- Akinbode, R., Lam, K. B. H., Ayres, J. G. & Sadhra, S. (2014). Voice Disorders in Nigerian Primary School Teachers. *Occupational Medicine*, 64(5), 382–386. Retrieved from <https://academic.oup.com/occmed/article/64/5/382/1437875>
- Alva, A., Machado, M., Bhojwani, K. & Sreedharan, S. (2017). Study of Risk Factors for Development of Voice Disorders and Its Impact on Quality of Life of School Teachers in Mangalore, India. *Journal of Clinical and Diagnostic Research*, 11(1), 1-5. Retrieved July 21, 2019 from [https://www.jcdr.net/articles/PDF/9234/17313_CE\[Ra1\]_F\(GH\)_PF1\(RB_RK\)_PFA\(DK\)_PF2\(NE_DK\).pdf](https://www.jcdr.net/articles/PDF/9234/17313_CE[Ra1]_F(GH)_PF1(RB_RK)_PFA(DK)_PF2(NE_DK).pdf)
- Angelillo, M., Di Maio, G., Costa, G., Angelillo, N. & Barillari, U. (2009). Prevalence of Occupational Voice Disorders in Teachers. *Journal of Preventive Medicine and Hygiene*, 50(1), 26-32. Retrieved July 18, 2019 from <https://www.ncbi.nlm.nih.gov/m/pubmed/19771757/>
- Assuncao, A. A., Bassi, I. B., De Medeiros, A. M., Rodrigues, A. M. & Gama, A. C. C. (2012). Occupational and Individual Risk Factors for Dysphonia in Teachers. *Occupational Medicine*, 62(7), 553-559. Retrieved from <https://www.ncbi.nlm.nih.gov/m/pubmed/22965866/>

- Cardoso, J. P., Ribeiro, I. Q. B., Araújo, T. M., Carvalho, F. M. & Reis, E. J. F. B. (2009). Prevalence of Musculoskeletal Pain among Teachers. *Rev Bras Epidemiol*, 12(4), 1-10. Retrieved from http://www.scielo.br/scielo.php?pid=S1415-790X2009000400010&script=sci_arttext&ting=en
- El Gendy, M. & Korish, M. M. (2017). Work Related Musculoskeletal Disorders among Preparatory School Teachers in Egypt. *Egyptian Journal of Occupational Medicine*, 41(1), 115-126.
- Erick, P. N. & Smith, D. R. (2014). Low Back Pain among School Teachers in Botswana: Prevalence and Risk Factors. *BMC Musculoskeletal Disorder*, 15. Retrieved July 17, 2019 from <https://bmcmusculoskeletdisord.biomedcentral.com/track/pdf/10.1186/1471-2474-15-3599>
- Hamid, A. A. A., Eldessouky, H. M., Iskender, N. M. & Hassan, E. M. (2014). Dysphonia in Teachers: Is It only A Matter of Voice Misuse? *The Egyptian Journal of Otolaryngology*, 30(3), 272-278.
- Houette, E., Claeys, S., Wuyts, F. & Lierde, K. (2012). Voice Disorders in Teachers: Occupational Risk Factors and Psycho-Emotional Factors. *Logopedics Phoniatrics Vocology*, 37(3), 107-116. Retrieved July 17, 2019 from <https://www.tandfonline.com/doi/abs/10.3109/14015439.2012.660499?src=rcsys&journalCode=ilog20>
- HowMed (2013). Occupational Health Hazards: Introduction and Types. Retrieved June 8, 2019 from <http://howmed.net/community-medicine/occupational-health-hazards-introduction-and-types/>
- Johns Hopkins Medicine (2013). Voice problems: An Occupational Hazard for Teachers. Retrieved July 15, 2019 from <https://www.hopkinsmedicine.org/news/e-newsletters/index.html>
- Kothari, C. R. & Gaurav, G. (2016). *Research Methodology: Methods and Techniques*. Mumbai: New Age International (P) Limited Publishers.
- Marcal, C. C. B. & Peres, M. A. (2011). Self-Reported Voice Problems among Teachers: Prevalence and Associated Factors. *Rev Saude Publica*, 45(3), 1-8. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/21519720>
- Nerrière, E., Vercambre, M., Gilbert, F. & Kovess-Masféty, V. (2009). Voice Disorders and Mental Health in Teachers: A Cross-sectional Nationwide Study. *BMC Public Health*, 9(370). Retrieved July 18, 2019 from <https://bmcpublichealth.biomedcentral.com/track/pdf/10.1186/1471-2458-9-3700>

- Ojoawo, A. O. & Orakwue, B. C. (2016). Work Related Musculoskeletal Pain among Teachers in Selected Public Secondary Schools in Ile-Ife, Nigeria. *Annals of Biomedical Sciences*, 15(1), 125-133. Retrieved July 19, 2019 from <https://www.ajol.info/index.php/abs/article/view/1336322>
- Ontario Ministry of Labour (2015). Occupational Health Hazards and Illnesses. Retrieved June 8, 2019 from https://www.labour.gov.on.ca/english/hs/topics/health_hazards.php
- Pizolato, R. A., Mialhe, F. L., Cortellazzi, K. L., Ambrosano, G. M. B., Rehder, M. I. B. C. & Pereira, A. C. (2013). Evaluation of Risk Factors for Voice Disorders in Teachers and Vocal Acoustic Analysis as an Instrument of Epidemiological Assessment. *Revista Cefac*, 15(4), 957-966. Retrieved July 22, 2019 from <http://repositorio.unicamp.br/bitstream/REPOSIP/26790/1/S1516-18462013000400025.pdf>
- Ramprasad, S., Das, N. L. & Maruthi, Y. A. (2014). Occupational Health Hazards among Teaching Community-A Questionnaire Based Survey. *ADR Journal*, 51-56. Retrieved July 18, 2019 from https://www.academia.edu/29139929/Occupational_Health_Hazards_among_Teaching_Community- A Questionnaire based Survey?auto=download
- Roy, N., Merrill, R. M., Thibeauit, S., Parsa, R. A., Gray, S. D. & Smith, E. M. (2004). Prevalence of Voice Disorders in Teachers and the General Population. *Journal of Speech, Language and Hearing Research*, 47(2), 281-293. Retrieved July 17, 2017 from [https://pubs.asha.org/doi/10.1044/1092-4388\(2004/023\)](https://pubs.asha.org/doi/10.1044/1092-4388(2004/023))
- Sebastian, S., Suresh, B. A., Simon, S. & Ballraj, A. (2013). Risk Factors for Hyperfunctional Voice Disorders among Teachers. *Online Journal of Health and Allied Sciences*, 11(2), 1-3. Retrieved July 18, 2019 from <http://cogprints.org/8894/>
- Sherman, F. (n. d). Teachers and workplace injuries. Retrieved on July 15, 2019 from <https://workchron.com/teachers-workplace-injuries-1473.html>
- Shyam, S. & Dutt, R. (2017). Determinants of Musculoskeletal Disorders among Small-scale Textile Workers: A Cross-sectional Study. *National Journal of Community Medicine*, 8(10), 611-615.
- Solis-Soto, M. T., Schon, A., Soliso-Soto, A., Parra, M. & Radon, K. (2017). Prevalence of Musculoskeletal Disorders among School Teachers from Urban and Rural Areas in Chuquisaca, Bolivia: A Cross-Sectional Study. *BMC Musculoskeletal Disorder*, 18(425). doi: 10.1186/s12891-017-1785-9. Retrieved July 19, 2019 from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5658995/pdf/12891_2017_Article_1785.pdf

- Vaghela, N. P. & Parekh, S. K. (2017). Prevalence of the Musculoskeletal Disorder among School Teachers. *National Journal of Physiology, Pharmacy and Pharmacology*, 8(2), 197-201.
- Williams, N. R. (2003). Occupational Groups at Risk of Voice Disorders: A Review of Literature. *Occupational Medicine*, 53, 456–460. Retrieved July 17, 2019 from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.550.3152&rep=rep1&type=pdf>
- Zadeh, N. M. & Fakhri, L. S. (2011). Primary School Teachers and Occupational Health: Blood Pressure, Voice Hoarseness, Allergy. *IPDER*, 5, 442-445. Retrieved July 18, 2019 from <http://www.ipedr.com/vol5/no1/94-H00188.pdf>