Investigating Sedentariness and Health Status of Primary School Teachers in Cape Coast Metropolis, Ghana

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Posted Date: 27 March 2023

doi: 10.20944/preprints202303.0447.v1

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Article

Investigating Sedentariness and Health Status of Primary School Teachers in Cape Coast Metropolis, Ghana

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Abstract: Objective: Physical inactivity is linked to chronic illnesses and disabilities among workers, especially those in high demanding jobs like teachers. Despite the global prominence of sedentary behaviour research, studies drawing the relationships between physical inactivity and multimorbidity among working teacher populations in low-and middle-countries remain untapped. This study assessed the sedentariness and health status of primary school teachers in Cape Coast Metropolis in Ghana. **Method:** This cross-sectional survey employed 1109 primary school teachers from the Cape Coast Metropolis in the Central Region of Ghana, using convenient sampling method. **Results:** Generally, the teachers were highly sedentary and reported poor health status. Other results showed no difference in sedentariness across gender, $t(1107) = -0.32$, $p > .05$. However, female teachers suffer more pain and discomfort, [$t(1103.51) = -3.07$, $p < .05$, anxiety and depression, [$t(1099.56) = -2.85$, $p < .000$,)], and poor health status [$t(1107) = 2.14$, $p < .05$, than their male counterparts. Also, pain and discomfort, anxiety and depression, health status and years of work significantly predicted sedentariness among the teachers, $F(4, 1104) = 5.966$, $p=.00$, $R = .145$, $R^2 = .029$, adjusted $R^2 = .018$. **Conclusion:** The findings suggest that individualized or personalized interventions are urgently needed to promote regular physical activity to improve the health status and reduce associated complications on the health and well-being, especially among the female primary school teachers. Given the health risks of sedentary lifestyle, behavioral interventions at the person-level (i.e., individualized- routine weekly physical activity programmes) and built environmental restructuring (e.g., creation of walkways to encourage regular walking) could be done to physical activity behavior among teachers within the Cape Coast Metropolis, and perhaps beyond.

Keywords: anxiety; depression; discomfort; pain; physical inactivity; sedentariness; self-rated health status

1. Introduction

Work is limiting the activeness of many individuals, increasing their act of sedentariness and its associated health conditions [1]. Over the past few decades, sedentary lifestyle has evolved as an important global public health concern. In the general population, sedentary behavior has been associated with an increased risk of cardiovascular conditions, mood disorders, and all-cause mortality [2]. Globally, about 3.2 million deaths each year are attributed to sedentary behavior, making it the fourth leading cause of deaths globally [3]. Sedentary behavior is any waking behavior characterized by an energy expenditure of less than 1.5 metabolic equivalents of task (MET) while in a sitting, reclining or lying posture [4].

Many individuals spend more of their wake hours at sitting positions. For instance, globally, 55% of people (23% male and 32% female), aged 18+ years, were insufficiently physically active [5]. In addition, the indication is that one in every five people in Europe takes little or no physical activity, with higher levels of inactivity found among eastern European countries [6]. In the European Union (EU), two thirds of the adult population do not reach recommended levels of activity [7]. As a result,

 doi:10.20944/preprints202303.0447.v1

physical inactivity is estimated to deprive Europeans an average of over eight million days of healthy life every year [7].

Not everybody will experience the effects of physical inactivity at the same level. In sub-Saharan Africa, physical inactivity-related non-communicable diseases are responsible for about 3 million deaths annually [8]. These deaths are expected to increase to 80% in the near future if urgent actions are not taken [9]. In Ghana, 94,400 (43%) of the total deaths in 2016 were as a result of NCDs related to physical inactivity [6]. In as much as physical activity participation in known to confer numerous health benefits, most people are still not making the conscious effort to stay physically active [10]. Physical activity is rapidly on the decline in all populations and age segments. Magnon, Vallet, and Auxiette [1] suggest that sedentary behavior is associated with employment, and that, influence of employment on daily life is an important determinant of sedentariness [12]. The burden of disease caused by physical inactivity does not only cause suffering to the victims, their families and friends, but also put a huge strain on health care systems and leads to a loss of productivity due to sickness absenteeism and presenteeism [13]. Thus, many categories of workers may suffer physical inactivity due to many work factors including stress, availability of facilities and work pressures.

The teaching profession is one of the jobs that can be very stressful due to work overload. The demands of teaching (e.g., work overload), and associated poor working conditions have consistently been reported in low- and middle-income countries which predispose teachers to occupational diseases such as high blood pressure, gastrointestinal problems or musculoskeletal disorders and negatively impact teachers' health and well-being [14,15]. Furthermore, at the psychological level, physical inactiveness aggravates the levels of stress, anxiety, and general fatigue [16]. Even though physical activity participation at recommended levels appears to have numerous health benefits [17], the levels of physical activity participation have shown to be less among teachers in many countries [5,16]. For instance, a study [18] on insufficient free-time physical activity and occupational factors in Brazilian public-school teachers showed a prevalence of 71.9% of physical inactivity resulting in poor work output. These authors reiterated that the adverse working conditions were increasing the prevalence of insufficient physical activity among the teachers. However, the authors failed to explore how insufficient physical activity affected the health of teachers, since such health contributes to quality teaching, training and production of quality graduate [19], for community and national development. A similar study [20] on the effects of physical activity on perceived general health of teachers in Spain showed that physical activities at low levels were more prevalent among the teachers (39%). In addition, it was revealed that teachers recorded a moderate (26%) and a high (35%) levels of physical activity. Thus, more teachers in Spain do not meet the WHO recommendation of 150 minutes of moderate-to-vigorous intensity of physical activity per week [21]. Though this study provides interesting findings, the study was centered on the three categories of physical activity as identified by the International Physical Activity Questionnaire (IPAQ) like walking, moderate and vigorous levels but failed to explore the relationship between sitting time (sedentary) and health status of the teachers [22].

Teachers at the basic schools in Ghana are classroom teachers employed by the Ghana Education Service. These teachers are required to teach all subjects in their respective classes. The teachers spend a better part of their day in the classroom teaching or marking assignments and exercises while attending to other student-related activities. Thus, the teaching duties create very little to no avenue for physical activity. Moreover, rapid urbanization or modernization has characterized significant variations in modifiable lifestyle, with sudden shift and improved access to public transport and more hours spent using digital technology, including frequent use of social media have significantly increased [23,24]. Observation indicates a common phenomenon where teachers are seeing frequent using their smartphones, laptops, and other electronic gadgets browsing social media content of interest during break times [25]. In addition to spending much time sitting to browse the internet, the built environment in most African context especially Ghana and in Cape Coast Metro are not exercise friendly as people compete with automobile for space during road jogging [26]. Additionally, the availability of taxis and other transport services at cheaper cost do not encourage active

 doi:10.20944/preprints202303.0447.v1

transportation among teachers [24]. This attitude contributes to physical inactivity among teachers as most of them travel to school by vehicles or motorcycles for most days of the week [27].

The trend of physical inactive or sedentary lifestyle may predispose many primary school teachers in Cape Coast to NCDs. Moreover, studies on physical inactivity or sedentariness and their health implications in academia have always focused on students [28]. There seems to be a dearth of empirical information, particularly on physical inactivity and sedentariness among teachers in the African region, which is a major hinderance for appropriate policy and personalized interventions aimed at reducing NCD burden. Therefore, there is the need to focus on research regarding physical inactivity and its adverse effects on the health status of teachers in Ghana. Therefore, the purpose of this study was to analyse the relationship between sitting time and anxiety/depression, sitting time and pain/discomfort and sitting time and the general health status as well as gender difference by sitting time among primary school teachers in the Cape Coast Metropolis of Ghana.

2. Materials and Methods

A cross-sectional descriptive survey was employed to study 1109 primary school teachers from the Cape Coast Metropolis. All the 1142 (census) primary school teachers in the Cape Coast Metropolis were invited to take part in the study. Out of a total population of teachers 1142 teachers, and with convenience sampling, 1109 teachers who were present I school at the time of the study or data collection (about 97% response rate) to part in this study. The available 1109 teachers comprised 556 males and 553 females. The teachers comprised 171 KG teachers, 434 primary school teachers and 504 Junior High School (J.H.S.) teachers.

These teachers have ages between 20 years and 45 years, making them very youthful. Majority of the teachers in the study area are trained teachers with a minimum qualification of diploma. Others hold higher qualifications such as bachelor's degree and master's degree. The experience of public basic school teachers ranges from 1 – 25 years. However, few of the teachers have taught for less than one (1) year.

Two pre-existing instruments (IPAQ short form and EQ-5D-3L) were used to collect data from participants for this study on their quality of health [29]. The IPAQ comprises of 4 generic items used to obtain information on health-related physical activity. The items focus on number of days and times spent in the last seven (7) days doing vigorous, moderate activities as well as days and time spent walking, and sitting or lying down for the last 7 days. This instrument has been used across Europe, Africa, Asia and America with high validity and reliability coefficients, 0.82 and 0.81, 0.79 and 0.84, 0.77 and 0.79 as well as 0.86 and 0.82 [30]. According to Group T. E. [32], the EQ-5D-3L instrument essentially consists of two parts, which are the EQ-5D descriptive system and EQ visual analogue scale (EQ VAS). The EQ-5D-3L descriptive system comprises five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Each dimension has three levels: no problems, some problems, extreme problems. The EQ VAS records the respondent's self-rated health on a vertical, visual analogue scale where the endpoints are labelled 'Best imaginable health state' and 'Worst imaginable health state' (the instrument, response options and ratings can be found here; https://euroqol.org/publications/user-guides). This instrument has been used and validated across nations in Africa, 0.88 and 0.79, 0.77 and 0.81 [32]. Data from our pilot study also yielded a reliability and validity of 0.85 and 0.84 for VAS and 0.70 and 0.81 for EQ 5D-3L respectively.

Ethical clearance and approval were sought from University of Cape Coast Institutional Review Board (ID-UCCIRB/CES/2019/30) for this study. Also, permissions were sought from Directorate of Regional and Metropolitan Education Service of Ghana Education Service, and the head teachers of the various basic schools in the Metropolis. The participants were contacted at school through their head teachers/mistresses and the questionnaire was distributed to them with the help of research assistants. The purpose of the study, issues of confidentiality, anonymity and voluntary nature of study were carefully written at the introductory page of the questionnaire where each participant read before taking part in the study. Study participants were asked to sign a consent form prior to the data collection exercise. Afterwards, they were asked to respond to the items on the questionnaire. Participants were given two days to complete and return the questionnaire because the researcher

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did not want the study to disrupt instructional time of the teachers. This data was collected between August and December, 2018, where each participant spent about 20 minutes responding the instrument.

Data were entered into Statistical Package for Social Science, IBM, version 21 for windows and went through a thorough screening process and analysis. A test for data normality and linearity were also carried out. The differences in gender by health status, pain and discomfort, anxiety and depression and sedentariness were analysed using independent sampled t-test). Also, multiple linear regression was computed to predict sedentariness from health status, pain and discomfort, anxiety and depression and years of teaching experience.

3. Results

To determine the gender difference in sedentariness, pain and discomfort, anxiety and depression, and health status, four independent t-tests were calculated. The test results showed no statistically significant difference in sedentariness based on gender, $t(1107) = -0.32$, $p > 0.05$, and that sedentariness among males ($M=32.26$, $SD=61.53$) did not differ from females ($M = 33.46$, $SD = 64.90$). Levene's test indicated equal variance, ($F = 0.037$, $p = 0.85$). Hence, there was no gender difference in sedentariness among male and female basic school teachers in the Cape Coast Metropolis. However, there was a statistically significant difference in self-reported health status between male and female teachers $t(1107) = 2.14$, $p < 0.05$. Thus, male teachers ($M = 52.50$, $SD = 36.63$) recorded an improved self-reported health status than their female colleagues ($M = 47.88$, $SD = 35.43$). Levene's test indicated equal variance ($F = 3.36$, $p = 0.067$). Other results show a statistically significant difference in pain and discomfort by gender, $t(1103.51) = -3.07$, $p < 0.05$. Males ($M = 1.23$, $SD = 0.48$) reported less pain and discomfort compared to females ($M = 1.33$, $SD = 0.51$). Furthermore, there was a statistically significant difference in anxiety and depression by gender, $t(1099.56) = -2.85$, $p < 0.000$, with females ($M = 1.3$, $SD = 0.51$) reporting slightly higher anxiety and depression scores than male teachers ($M = 1.21$, $SD = 0.47$).

Multiple linear regression was computed to predict sedentariness of the teachers using pain and discomfort, anxiety and depression, health status, and years of teaching experience as predictors. The test results showed that the model involving all four independent variables significantly predict sedentariness of the teachers, $F(4, 1104) = 5.966$, $p=0.00$, $R = .145$, $R^2 = 0.029$, adjusted $R = 0.018$. Thus, pain and discomfort, $\beta = 0.176$, $t(1105) = 4.40$, $p < 0.05$ and anxiety and depression significantly predict sedentariness among the teachers, $\beta = .102$, $t(1105) = -2.58$, $p < 0.05$. Furthermore, years of teaching experience significantly predict sedentariness, $\beta = 0.077$, $t(1105) = -2.49$, $p < 0.05$, but not health status of the teachers, $\beta = 0.045$, $t(1105) = 1.48$, $p > 0.05$.

Table 1. Predictors of sedentariness of basic school teachers in Cape Coast.

Variable	B	beta	T	P
Constant	23.140	.	3.606	.000
Pain and discomfort	22.363	.176	4.403	.000*
Anxiety and depression	-13.089	.102	-2.580	.010*
Years of Teaching experience	-.724	.077	-2.488	.013*
Health status	.078	.045	1.484	.138
R	.145			
R^2	.029			

 doi:10.20944/preprints202303.0447.v1

Adjusted R	.018

F-ratio = 5.966, df = (4, 1104), p < .05.

4. Discussion

This study assessed sedentariness and associated health status of primary school teachers in Cape Coast Metropolis in Ghana. The findings indicated no significant difference in sedentary behaviors of male and female basic school teachers. There are no gender specific roles in the teaching profession in Ghana, since teaching schedules relative to time-tables, class periods, time allocations, and non-academic obligations such as sports and religious activities within each academic year are not gender-specific among teachers. Thus, teaching and teaching-related activities are similar across curricula schedules among male and female teachers in Ghana. Occupationally, there are no gender specific roles among the teaching staff of Ghana Education Service nationwide because both men and women alike spend same amount of time in schools performing similar tasks [33]. These routines may involve sitting and standing with an energy expenditure of less than 1.5 METs per day leading high sedentary behavior [34]. Even though studies suggest that, men are generally active than women [35].

Sedentary behaviors associated with teaching such as long hours of sitting to mark assignments, mark attendance, attending meetings, writing lesson notes, among others, predispose teachers (both male and female alike) to cardiovascular diseases and other non-communicable diseases. Since standing and sitting are daily routines for all teachers in the basic schools [36], it is not surprising that the teachers do not differ in sedentary behavior. However, it is worrying to know that basic school teachers in Cape Coast Metropolis spend about 16 hours (8 hours at work and 8 hours sleeping) out of the 24 hours being sedentary and inactive. Badr, Rao and Manee [33] explained that, there is no gender difference in sedentary life among teachers because both men and women are equally likely to have jobs that involve sitting and desk work. Also, there are similar pressures for both genders to keep up with their work responsibilities and thus, may not have the time to engage in physical activities. Unfortunately, sedentariness predisposes teachers to NCDs, the fourth leading cause of all deaths globally, that may negatively impact their level of quality teaching in the schools [37]. And if care is not taken many teachers in Cape Coast would suffer several NCDs leading to early retirement and possibly deaths, a situation that compromises quality teaching and production of quality graduates.

The finding further showed that female teachers reported a poorer self-rated health status as compared to male teachers. The gender differences on health status among the teachers can vary greatly [38]. Usually, women tend to spend more time in sedentary activities than men, and this can have an overall negative impact on their health and quality of work outputs. Again, women are more likely to suffer from chronic diseases such as obesity, diabetes, and heart disease due to their more sedentary lifestyles, that in turn compromise their ability to be more productive at work [39]. Also, women are more likely to suffer from depression, anxiety, and other mental health issues due to complications of physical inactivity or vice versa [40]. Men, on the other hand, tend to be more active and engage in more physical activities [35]. These physical activity engagements can have a positive impact on their health and teaching outputs because physical activity is believed to improve mental and physical well-being [41]. This may provide some amount of protection to men to suffer from chronic illnesses and other health issues [42]. Overall, it is important for both genders to engage in regular physical activity to improve and maintain their health and well-being, contribute proactively to quality teaching and training of students in the country [43]. This becomes essential as our findings revealed that more females are teaching at the primary education level.

The results further revealed that female teachers suffer more pain and discomfort compared to their male counterparts. Gender differences on pain and discomfort perception among teachers is an important area of research [44]. Recently, Prieto-González et al. [45] found that, female teachers tend to be more sedentary than male teachers, and this difference was associated with greater pain and discomfort perceived by females. Earlier, Vaghela, and Parekh [46] found that female teachers

reported higher levels of neck, shoulder, and lower back pain than the male teachers. Similar evidence [47] identified a link between sedentary behavior and musculoskeletal pain in teachers, with female teachers more likely to experience severe pain. Furthermore, female teachers are more likely to use passive coping strategies in response to pain, such as taking medication, which may contribute to increased pain and discomfort. Therefore, it is important to consider the role of gender in sedentary life and its effect on pain and discomfort among teachers.

The finding again indicates that female basic school teachers in Cape Coast Metropolis reported more anxiety and depression than their male counterparts. Anxiety and depression continue to be a problem among teachers [48], which adversely affect teachers' physical health and mental well-being [49]. Moreover, it is noted that teaching is one of the professions that exposes workers to stress, depression and anxiety due to a combination and multifaceted characteristics of their work-related activities [50]. For instance, studies have found that female teachers are more likely to experience anxiety and depression than male teachers [51]. This gender gap is most pronounced when teachers are overwhelmed by their workloads or lack of control over their work [52]. Baluyos, Rivera, and Baluyos [53] found that female teachers also tend to experience higher levels of job insecurity than male teachers, that may compromise the anxiety and depression levels of the female teachers. Additionally, female teachers may be at a greater risk of burnout due to their levels of stress from work overload. Thus, female teachers need practical interventions (e.g., anxiety-stress reduction techniques) to improve their mental health and be able to deliver quality teaching.

We found that levels of pain and discomfort, anxiety and depression, years of teaching experience, and health status of the teachers predicted their sedentariness. Despite all the variables significantly predicted sedentariness of the teachers, pain and discomfort contributed more to the model. This outcome presupposes that, the more sedentary these teachers are, the more pain and discomfort they are likely to feel. El-Tallawy et al. [54] espoused that, a sedentary lifestyle is associated with increased pain and discomfort. Inactivity can lead to a number of disorders, including weakened muscles, joint stiffness, and poor posture [55]. Additionally, prolonged sitting can strain the spine and increase the risk of back pain. Hence, regular physical activity can help to strengthen muscles, improve posture, and reduce the risk of developing chronic pain and discomfort [56].

Limitations

Though this study highlighted sedentariness and associated health status of the primary school teachers in the Cape Coast Metropolis, it has some limitations. This is a survey that comes with self-reported data. Probably, adding interview would have given us a more in-depth data from the perspectives of the teachers. Also, about 371 of the teachers did not provide time duration for their physical activities per week. Thus, it was impossible to calculate their weekly physical activity MET and to determine their PA levels. Fortunately, they provided the time duration for their sitting per week, which enabled us to calculate their sedentariness. It is important that another study explore how physical activity and sedentariness of teachers contribute to their quality teaching and students' academic performance.

Practical implications

Unfortunately, physical inactivity or sedentariness is increasing the burden of NCDs, with available evidence suggesting that people regardless of gender who are insufficiently physically active have a heightened risk of all-cause mortality, compared to those who engage in at least 30 minutes of moderate-intensity physical activity on a regular basis [57]. Improved health and well-being of teachers are key to improving teaching quality for a strong educational foundation for early grade students. Moreover, teacher physical inactivity may increase the propensity for overweight and obesity, and the rate of other chronic illnesses and disorders. Thus, not only the teachers, their families, students and the education system that may suffer due to the ill health of these teachers, the healthcare system would be treating large numbers of complex NCDs. Also, pragmatic efforts such as policy and other evidence-based health interventions to improve physical activity levels of these teachers are required. The current findings suggest the importance of creating opportunities for

regular physical activity modification. Creating personalized or individualized interventions could be helpful in improving energy imbalance among these teachers. This initiative can boost physical activity routines at work through health promotion programmes. Built environment restructuring (e.g., creating walkways and physical workspace design) that is user friendly could also help increase physical activity behavior among these teachers. Future studies are required to investigate the clinical effectiveness of physical activity on mental health effects across a larger teacher population group in Ghana.

5. Conclusions

Primary school teachers in the Cape Coast Metropolis were highly sedentary, with the female teachers reporting poorer health status including, severe pain and discomfort, elevated anxiety and depression than the male teachers. It was also observed that the sedentariness among these group of teachers was associated with pain and discomfort, anxiety and depression, health status and years of work of the teachers. The findings suggest that regular physical activity, a major health promoting behavior, is highly recommended for these teachers to aid in the prevention and management of potential NCDs. Tailored multi-faceted behavioural activities could range from more light- to moderate-to-vigorous intensity physical activity (e.g., walking, skipping), including playing sports and cycling. These activities would help improve the health status of these teachers, which would in turn, boost teaching productivity in the Cape Coast Metropolis.

Author Contributions: Conceptualization and study design, EWA, MA, NJ, EAA, & JEH, data curation, MA and NJ, data analysis and development of initial draft, EWA, MA, NJ, and EAA. All authors edited and considerably reviewed the manuscript, proofread for intellectual content and consented to its publication.

Funding: The study received no external funding. However, we sincerely thank Bielefeld University, Germany, for providing financial support through the Institutional Open Access Publication Fund for the Article Processing Charge (APC).

Ethics approval and consent to participate: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board of the University of Cape Coast (ID-UCCIRB/CES/2019/30), in February 2020.

Consent for Publication: Informed consent was obtained from all subjects involved in the study. Participants and the heads of the schools were duly informed and they gave consent and approval that results and findings from this study could be published.

Data Availability Statement: The data is deposited and available here https://osf.io/c4yz9/

Acknowledgments: The authors thank the authorities of Ghana Education Service in the Central Region.

Competing Interest: Authors declare that they have no competing interest.

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