UNIVERSITY OF GHANA

SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

FACTORS ASSOCIATED WITH SEDENTARY BEHAVIOUR AMONG BASIC SCHOOL CHILDREN IN ADENTA MUNICIPALITY, GREATER ACCRA REGION.

BY

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DECLARATION

I, **ESTHER SERWAA AGYEI-KWAKYE**, do hereby declare that apart from other people's knowledge that I have duly acknowledged, this dissertation is the result of my dedicated efforts under competent supervision. I take full responsibility for this work.

…… ……

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(Supervisor)

DEDICATION

I dedicate this work to my supportive parents Mr. Francis Ernest Kwabena Asante and Mrs Mercy Asante. God bless you richly.

ACKNOWLEDGEMENT

I thank God for his grace that has brought me this far in my academics. I wish to express my sincere gratitude to my academic supervisor, Dr Richmond Nii Okai Aryeetey of School of Public Health for his guidance, contribution and mentorship. My appreciation also goes to the authorities of Adenta Community School and Deyoungsters International School for their cooperation in enabling me collect data from their schools. I thank my parents, husband, brother and friends for their support during this period. May God richly bless you all.

ABSTRACT

Background: Sedentary behaviour is characterised by energy expenditure ≤ 1.5 metabolic equivalents (METs). Common sedentary activities include television viewing, video game playing, computer use, driving automobiles, and reading.

In addition, children also spend time engaging in sedentary hobbies like sitting or lying to read, sitting to chat with friends, drawing, and writing. Sedentary behaviour assessment is important because of its linkages with poor health outcomes like cardiac disease, hypertension, diabetes, and obesity.

Objective: This study assessed sedentary behaviour and associated factors among basic school children in the Adenta Municipality.

Methods: A cross-sectional study design with quantitative data collection was utilized in this study. A multistage sampling approach was used to select 385 adolescents from a public and private basic school in Adenta Municipality. Prevalence of school children engaging in sedentary behaviour was estimated using a cut point of ≥ 2h/day of engagement in a sedentary activity in the questionnaire to categorize the outcome. Multiple logistic regression was used to analyse the association between sedentary behaviour and some associated child (age, sex, educational level, type of school), parental (mother's educational level, father's occupation, father's educational level, father's occupation, parental rules on screen time), and environmental factors (sports facilities at home, sports facilities in school) separately for weekdays and weekends.

Results: The mean age of respondents was 13.2 ± 1.3 years. (Range 11-18 years.). Slightly more than half (52.2 %) were females. Majority were in Junior high school (83.6%). Public school respondents constituted 56.9%. More than two-thirds (72.2%) reported sedentary behaviour

during weekdays and 84.9% on weekends. After adjusting for these factors, (educational level of child, school type, father's education) none of the factors explained variance with sedentary behaviour on weekdays. For weekends, the following factors had significant associations with sedentary behaviour in the adjusted model: absence of sports facilities at home, school type and maternal occupation. Children who lacked sports facilities at home were 1.9 times more likely to be sedentary (aOR = 1.9, 95% CI = 1.02 – 3.8), children in public schools were significantly less likely to engage in sedentary behaviour compared to those in private schools (aOR = 0.4, 95% CI = 0.2 – 0.9). A child was more likely to be sedentary on weekends, if the mother is a petty trader (aOR = 6.6, 95% CI = 1.3 – 33.1) or employed as a civil servant (aOR = 4.9, 95% CI = 1.01 – 23.9) compared to those children whose mothers were unemployed. The most common sedentary activities children were found to engage in are watching television, sitting reading a book or magazine, using the computer (to browse the internet and studying), and playing computer or video games.

Conclusion: The study shows a high prevalence of children being sedentary in the study area. Screen devices were the common tools utilized in being sedentary. The associations of sedentary behaviour with absence of sports facilities in homes, type of school and maternal occupation should be considered in efficient interventions on SB control.

Recommendations: Parents are to be physically active and encourage their children to do same at home and in the communities to possibly minimize sedentary pursuits. There should be enforcement of rules on screen time by parents in and out of the home for children. There must also be awareness creation on sedentary behaviour through public education and in schools.

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DEFINITION OF TERMS

Sedentary Behaviour characterizes activities with energy expenditure ≤ 1.5 metabolic equivalents (METS), while in a sitting, reclining, or lying posture (Tremblay et al 2011).

Metabolic Equivalent is a unit used to estimate the amount of oxygen used by the body during physical activity. It is used to quantify the intensity of physical activity by comparing metabolic rate during exercise to the metabolic rate at rest.

Non Communicable Diseases are non-infectious chronic diseases that are as a result of genetic, physiological, environmental, and behaviour factors. They include cardiovascular diseases, diabetes, cancers, and chronic respiratory diseases.

Cardiovascular Diseases are heart and blood vessels pathologies that include coronary artery disease (angina and myocardial infarction), heart failure, high blood pressure, stroke, and cardiomyopathy.

Metabolic Syndrome A group of conditions that usually occur together and increases one's risk of diabetes, stroke, and cardiovascular disease. It includes obesity, high blood pressure, hyperlipidemia (high lipids/fats), and insulin resistance.

LIST OF ABBREVIATIONS

BMI	Body Mass Index
HBSC	Health Behaviour in School Aged Children
GHS	Ghana Health Service
METs	Metabolic Equivalents
MoH	Ministry of Health
SHEP	School Health Educational Programme
WHO	World Health Organization
MS	Metabolic syndrome
CVD	Cardiovascular Disease
SBQ	Sedentary Behaviour Questionnaire

CHAPTER ONE

INTRODUCTION

1.0 Background to the Study

Sedentary behaviour constitutes any waking behavior characterized by energy expenditure ≤ 1.5 metabolic equivalents (METS), while in a sitting, reclining, or lying posture (Tremblay et al, 2011). Common sedentary activities are television viewing, video game playing, computer use, driving automobiles, and reading.

There are increasing concerns of emerging sedentary behavior among children (Active Living Research, 2014). Active transport is being replaced with automobiles like cars in children. Active travel to school has declined among young people with a correspondent rise in the proportion of children travelling by cars (Liu, Wu, & Yao, 2015).

Current evidence suggests that regardless of physical activity or exercise, longer durations of sedentary engagements negatively affects health outcomes (Tremblay et al, 2011). Limiting sedentary behavior can have a positive effect on health and wellness at all ages (Teychenne, Ball, & Salmon, 2012).

Several benefits have been identified for being physically active. These include improved learning and attention, improved movement skills, maintaining a healthy body weight, and decreasing risk of non-communicable diseases like diabetes and heart disease (Epstein, Paluch, Gordy, & Dorn, 2000).

Children who engage in sedentary lifestyle have higher fat mass and body mass index and are

more likely to be obese even when they engage in physical activity than those who are not sedentary (Aznar, Lara, & Queralt, 2017). It's been noted that prolonged sitting time is detrimental to health (Wosje et al., 2009). Children most likely can have periods of interruption in sedentary behaviour since they are more likely to be active hence interrupting their sedentary time may be a good intervention strategy. In a recent study, higher proportions of children in a lot of European countries do not meet the moderate to vigorous physical activity (MVPA) recommendations which suggests at least 60minutes daily exercising (Pearson, Haycraft, Johnston, & Atkin, 2017). Literature also shows that the propensity to engage in SB can differ on weekdays and weekends **(**Marshall et al., 2015). Surveillance proves that, a significant proportion of children have been found to exceed the usually acceptable guideline of ≤ 2 hours per day of screen time (Foley, Maddison, Jiang, Olds, & Ridley, 2011). The first evidence-based SB guidelines in the world were published in Canada in 2011. This was based on the evidence of SB posing adverse health effects and so recommendations were made to limit time children spend in sedentary pursuit during the day **(**Carson et al., 2013).

1.1 Problem Statement

Sedentary behaviour has been recognized as a risk factor worldwide for many disorders and non-communicable diseases like obesity, hypertension, cardiovascular disease, and diabetes. (Novosa et al., 2014). Ghana is recording increasing cases of non-communicable diseases like heart disease, diabetes, and hypertension which are associated with sedentary behaviour and other risk factors among adults (Agyei-mensah & Aikins, 2010; Addo, Ofei, Bosu, & Agyemang, 2012) and also children (Ofori-Asenso, Agyeman, Laar, & Boateng, 2016).

Globally, sedentary behaviour has been shown to be highly prevalent with World Health Organisation reporting about 60 to 85% of the world's population being sedentary (WHO, 2012). Miquetichuc et al. (2016) has found prevalence of sedentary behavior to be 66.8% among school children in Brazil. There is also a documented prevalence of SB among primary and secondary school children in Brazil as 69.2% on weekdays and 79.6% on weekends (Wiltgen et al., 2016).

Most international studies have highlighted how some factors like age, sex. parental screen time rules, type of school children attend, and home environment influence sedentary behvaiour.

However, in developing countries like Ghana, there is limited documentation and evidence on children's sedentary lifestyle in terms of duration spent on sedentary activities per day, how often children are sedentary, the prevalence of sedentary lifestyle in children, the main sedentary activities that children engage in and the major factors that increase or decrease the likelihood of sedentary pursuits in children in Ghana.

Also, although there has been a shift from traditional active lifestyles to sedentary lifestyles, there is limited evidence on sedentary lifestyle in developing countries such as Ghana in the school-aged population (Muthuri et al., 2014). The subject has not been extensively explored to generate data on local sedentary patterns though its an area of public health concern due to its linkages with poor health outcomes. Most of the data available are exclusively international and hence the need to address these gaps.

1.2. Justification of the Study

This study sought to provide evidence-based research into factors associated with sedentary behaviour among basic school children in Adenta municipality. This study was not to only

contribute to the existing body of knowledge of factors associated with sedentary behaviour in children, but also to provide new knowledge on sedentary lifestyle among children in the Adenta municipality.

Sedentary life is common among the people with higher socio-economic status or higher income groups (Shuval, Li, Pettee, & Tchernis, 2017). This study was to provide an opportunity to assess the prevalence of SB and its associated factors. The prevalence and factors, when established, will enable policy makers and implementers to formulate targeted strategies to curb sedentary lifestyle as well as take immediate steps to prevent sedentary lifestyle. Findings from this study may inform the GES, MoH and GHS to improve on the School Health Educational Programme (SHEP), by helping to design educational messages on non-communicable diseases and how an active lifestyle can be a preventive measure. Findings in the study will be shared with school authorities to include discussions on sedentary behavior to raise awareness.

Ultimately, this may reduce the risks of developing diseases associated with sedentary lifestyle like obesity, coronary heart disease, hypertension, osteoporosis, type 2 diabetes, depression, and lipid abnormalities (Miquetichuc et al., 2016).

1.3. Objectives

The objectives of this study are divided into general and specific. These have been indicated below.

1.3.1. General Objective

To assess the prevalence and factors associated with sedentary behaviour among basic school children in Adenta Municipality.

1.3.2. Specific Objectives

The specific objectives of the study have been outlined as:

1. To determine the prevalence of sedentary behavior among basic school children in Adenta Municipality.
2. To determine the common sedentary activities that basic school children in Adenta Municipality engage in.
3. To determine the child, parental and environmental factors associated with sedentary behavior among basic school children in Adenta Municipality.

1.4. Research Questions

1. What is the prevalence of sedentary behaviour among basic school children in the Adenta Municipality?
2. What are the common sedentary activities basic school children in Adenta Municipality engage in?
3. What child, parental and environmental factors are associated with sedentary behavior among basic school children in Adenta Municipality?

1.5. Conceptual Framework for the Study

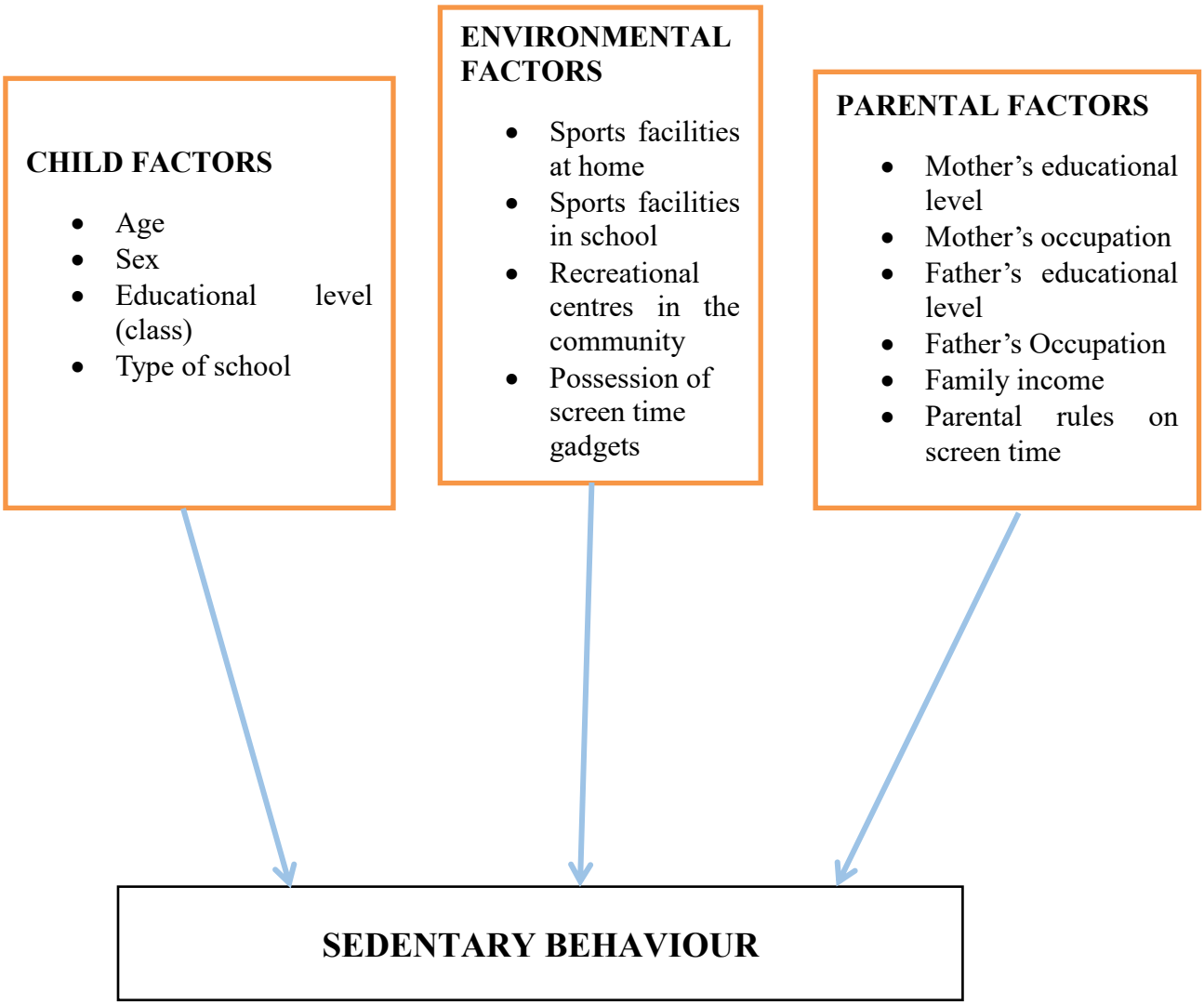

Figure 1.1: Conceptual Framework for Sedentary behaviour among children from primary six to junior high school.

Source: Author generated

1.5.1 Narrative of the Conceptual Framework

Sedentary behavior is influenced by many factors. Particularly among children, some of these factors could be related to the child, parents or the environment. Parental factors that may be

associated with sedentary behavior are mother's educational level, mother's occupation, father's educational level, father's occupation, household income and presence of parental rules on screen time.

The educational level of a mother can influence sedentary behaviour in children (Muthuri et al., 2016). Similarly, the mother's occupation may influence sedentary behaviour in children (Vázquez-nava et al., 2013). Sedentary behaviour in children may vary with differences in educational level of fathers (Muthuri et al., 2016). Additionally, father's occupation can also influence sedentary patterns (Vicente-rodriguez et al., 2018). The presence of parental rules on amount of time the child spends on television or computer may be associated with sedentary behaviour. (Xu, Wen, & Rissel, 2015). Household income may influence sedentary behaviour in children (Shuval et al., 2017).

Child factors such as age, sex, educational level (class), and type of school can influence child sedentary behaviour. Increasing age may change sedentary behavior in children. Sedentary behaviour may differ between males and females (Davies, Greenfield, & Edwards, 2016).

Whether a child is in a public or private school may be associated with sedentary behaviour (Davies, Greenfield, & Edwards, 2016).

Environmental factors that may be associated with sedentary behaviour include sports facilities at home (Veitch, Arundell, Hume, & Ball (2018), sports facilities in school (Morton, Atkin, Corder, Suhrcke, & Sluijs, 2016), and possession of screen gadgets (Maitland, Stratton, Foster, Braham, & Rosenberg, 2013).

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CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents some existing literature related to child, parental and environmental factors associated with SB.

2.1 Definition of Sedentary Behaviour

The term sedentary behaviour includes activities that yield no appreciable increase in expending energy above the level of resting (Tremblay et al., 2011). It includes sitting, lying down, watching television, and the use of other screen devices (Pate, O'neill, & Lobelo, 2008). SB connotes activities that utilise energy at the level lower than 1.5 metabolic equivalent units (METs) (Thorp, Owen, Neuhaus, & Dunstan, 2011).

2.2 Activities that constitute Sedentary Behaviour

According to Rey-López, Vicente-Rodríguez, Biosca, and Moreno (2008), sedentary lifestyle patterns in children and adolescents include playing video games, using computers, and especially watching television in excess (2 hours or more daily). Other activities include driving automobiles, reading, sitting, or lying down (de Rezende, Rey-López, Matsudo, & do Carmo Luiz, 2014). According to Visser and Koster (2013), napping, reading, listening to music, long talking on the telephone and talking to friends also constitute sedentary behaviour.

2.3 Duration spent on Sedentary Behaviour

According to Colley (2011), in Canada, children and adolescents spend an average of 8.6 hours daily or 62% of their waking hours being sedentary. Similar findings have been reported in the U.S. with children and youth spending an average of 6-8 hours daily being sedentary (Liu et al, 2015). It has also been found that children spend about 2.6 hours per day on screen time in Brazil (Augusto & Jesus, 2010).

2.4 Effects of Sedentary Behaviour

Sedentary behaviour, recognized as the lack of physical activity is a risk factor for many diseases, such as obesity, hypertension, cardiovascular diseases, and diabetes mellitus (Nosova et al., 2014).

Sedentary behaviour in children and adolescents like playing video games, using computers, and watching television, have been associated with obesity (Rey-López et al., 2008).

Some studies have shown that, independent of physical activity levels, sedentary behaviours are associated with increased risk of cardiac and metabolic diseases and a variety of physiological and psychological morbidity (Colley et al., 2011; Treuth et al., 2007).

According to Tremblay et al. (2011), being highly sedentary has a negative impact on one's health regardless of some other factors like weight control, dietary intake, and physical activity.

Long duration of sedentary behaviour has been proven to have unfavorable health outcomes even after satisfying the recommendations of physical activity (Grøntved & Hu, 2011).

In 2011, the relationship between time spent in being sedentary and risk factors for CVD and MS was evaluated in eleven studies. All the studies showed that increasing sedentary time was linked with a higher risk for CVD or MS (Tremblay et al., 2011). Those who are sedentary had a higher likelihood of developing systemic hypertension as opposed to their peers who have short daily sedentary time (Dasgupta et al., 2006).

Other studies show that children who usually watch television for more than two hours daily were prone to developing higher levels of cholesterol in their serum (Hancox, Milne, & Poulton, 2004).

In total, physical wellbeing, cardiovascular health, and musculoskeletal fitness is affected negatively when there is prolonged duration of sedentary time. However, further evidence suggests that decreasing sedentary time has a positive impact on one's health (Epstein, Paluch, Gordy, & Dorn, 2000).

Another research proved that using the computer for longer than 2 hours per day had an association with musculoskeletal fitness being reduced (Wosje et al., 2009).

A study concluded that being sedentary was linked with decreased self-esteem in boys, and pronounced aggression in girls (Neumark-Sztainer, Goeden, Story, & Wall, 2004).

In addition, sitting for long hours raise the likelihood of a waist circumference that is big, being depressed, social isolation, and a likelihood of dying early (de Rezende et al., 2014).

2.5 Prevalence of Sedentary Behaviour

World Health Organization (2012) reports that 60% to 85% of people in the world are sedentary making SB an important issue of public health concern. Miquetichuc et al. (2016) in a cross sectional study conducted in Brazil found the prevalence of sedentary behaviour as 66.8% among school children aged 14-18. Also, a study among primary and secondary school children in Brazil showed a high proportion of children being sedentary with a prevalence of 69.2% on weekdays and 79.6% on weekends (Wiltgen et al., 2016).

SB has been shown to be more likely in african adolescents and especially in those from affluent homes (Asare & Danquah, 2015). In the Association of Southeast Asian Nations (ASEAN) region, the proportion of sedentary behaviour was estimated to be 33% among children of ages 13-15 years and it ranged from 10.5% in Cambodia to 42.75 in Malaysia (Peltzer & Pengpid, 2013).

2.6 Factors Associated with Sedentary Behaviour

Factors associated with Sedentary Behaviour among children were reviewed under three broad areas. These were child factors, parental factors and environmental factors.

2.6.1 Child Factors Associated with Sedentary Behaviour

Sex

Sedentary lifestyle was practiced more by females than males in both public schools and private schools (Miquetichuc et al., 2016). Sex had no significant association with being sedentary. (Davies, Greenfield, & Edwards, 2016).

Conversely, Klitsie et al. (2013) found that boys utilised screen time based sedentary behaviour

more than girls. Also, in another study, it was evident that the pattern of SB in girls was in the line of talking over the phone and texting whilst boys were found to be watching television and playing computer games (Liwander, Pederson, & Boyle, 2013).

Fairclough, Boddy and Stratton (2009) found a greater proportion of boys than girls spending ≥ 1 hour per weekday and weekend watching television and playing video games suggesting that boys engage more in screen time sedentary lifestyles. According to Crosatti et al. (2016), being female was associated with being less sedentary.

Type of School

According to Miquetichuc et al. (2016), sedentary lifestyle does not differ among pupils from public and private schools. School type was not significantly associated with sedentary behavior (Davies, Greenfield, & Edwards, 2016). However, a study by Augusto and Jesus (2010) proved that children in private schools were spending longer durations of time being sedentary as compared with those in public schools.

2.6.2 Parental Factors Associated with Sedentary Behaviour

Mother's Educational Level

Low maternal educational level is linked with sedentary lifestyle in primary school-age children (Vázquez-nava, Treviño-garcia-manzo, Vázquez-rodríguez, & Vázquez-rodríguez, 2013). There was an association between maternal education and child obesity in Colombia and Kenya. Educated mothers were more likely to have children 9-11 years old who were overweight (Muthuri et al., 2016).

Mother's Occupation

Having a mother who works, has an association with primary school-age children being sedentary (Vázquez-nava et al., 2013). The AVENA study among Spanish adolescents showed that maternal occupation influenced time spent on sedentary behaviour. There was an inverse relationship between a mother being employed and their children being sedentary. Children with working mothers were found to be less sedentary than those with unemployed mothers (Vicente-rodriguez et al., 2018). Manuscript and Work (2015) indicates that children whose mothers engage in longer durations of work watch television the most and for longer periods.

Father's Educational Level

Results from some studies in 12 countries to assess the relationships between parental education and physical activity in 9–11 year old children revealed an inverse relationship between paternal education and less physical activity in Brazil and the USA. Educated fathers had lower significant odds of having less active children (Muthuri et al., 2016).

Father's Occupation

Also in the AVENA study, children with employed fathers spent less time in sedentary activities than those with unemployed fathers (Vicente-rodriguez et al., 2018).

Family Structure

Living in a non-intact family appears to be associated with sedentary lifestyle in overweight primary school-age children (Vázquez-nava et al., 2013).

Parental Rules On Screen Time

Absence of parental rules on electronic screen time can significantly predict children's sedentary behaviour (Roberts, Rodkey, Ray, Knight, & Saelens, 2017). Lack of enforcement of rules on

maximum hours spent on screen time daily was linked with watching television and playing video games for longer durations (Roberts, Rodkey, Ray, Knight, & Saelens, 2017) Four out of seven studies found that setting rules on television time resulted in children engaging in less screen time (Xu, Wen, & Rissel, 2015). Furthermore, limiting screen time behaviours have been found to be associated with lower sedentary time (Solomon-moore et al., 2017).

Household Income

In a study to assess the relationship between annual household income, sedentary behaviour, light, and moderate-vigorous intensity physical activity, it was concluded that higher annual household income is related to more intense, less frequent (per week) patterns of physical activity and more daily sedentary time (Shuval et al., 2017).

2.6.3 Environmental Factors Associated with Sedentary Behaviour

Media Gadgets

The presence of media gadgets in the home was found to contribute to children being sedentary. However, being less sedentary and engaging in physical activities were promoted by physical activity devices being available in homes (Maitland, Stratton, Foster, Braham, & Rosenberg, 2013).

Home Environment

In a qualitative study undertaken by Veitch, Arundell, Hume and Ball (2018), it was evident that the home environment was an important factor that regulates the activity of children. Most children admitted that the size of the compounds in their homes contributed to whether they will engage in other physical activities or use screen time gadgets. Furthermore, most of them

responded that the proximity of parks within their neighborhoods to their homes determined whether they would be at those parks to play or not. The types of facilities available at those parks were also an important deciding factor in their utilization.

School Environment

Students in schools with recreation facilities and parks were noted to record lower sedentary behaviour at school (Crosatti et al., 2016). Hence, having a park and a recreational centre served as a protective factor for sedentary lifestyle (Crosatti et al., 2016).

Playgrounds and activity structures promote physical activity in children thereby minimizing sedentary times during school hours (Morton, Atkin, Corder, Suhrcke, & Sluijs, 2016). These factors within the environment offer an opportunity for children to be physically active.

CHAPTER THREE

METHODS

3.0 Introduction

This chapter explains the scientific methodology utilized in the entire study.

3.1. Study Design

This study utilized a cross-sectional design using a quantitative approach to determine factors associated with sedentary behavior among basic school children in the Adenta Municipality.

3.2. Study Area

According to the 2010 census, the population of Adenta Municipality is 78,215 of which 50.3 % are males and 49.7% females. The urban area contains 62.5 % of the population with 37.5 % in the rural areas. There are 20,478 households. There is an average of 4 persons in a household. Children form a largest proportion of the household members accounting for 35.1%. About 4 out of 10 of the population who are 12 years and older are married. The records show that those who have never been married are 46.7% with 6.8 % are in consensual unions, widows constitute 2.3%, 2.4% are divorced and 6.6 % separated. About 42.7% of females are married by age 25-29 years compared to their male counterparts (21.7%).

Widowed females are as high as 49.5% by age 65 or more while widowed males are just 9.0% at such comparable age. For those married, 9.9 % have had no formal education while about 4.4% of those who are unmarried have never been educated formally. About 8 in 10 of those married are employed with 14.6 percent not economically active. A larger proportion of those who have never married (47.9%) are not active economically and 7.5 % of them are also not employed. Of

3.3 Study Population

The study population consisted of basic school children in one public and private school in the Adenta municipality. This was done to compare sedentary lifestyle in children in public and private schools.

3.4 Sampling Technique

The study applied a multi stage sampling method to select study participants from the selected schools. Firstly, a list of basic schools in the Adenta municipality was collected from the Municipal Educational Directorate, Ghana Educational Service. This list was categorised into public schools and private schools. One public school and one private school were selected using a simple random sampling approach. The lottery method of simple random sampling was utilized to pick a private and public school from the list of private and public schools respectively. Additionally, the total enrollment of school children from primary six to junior high school in the selected schools were taken from the schools' registers as $\mathbf{N_{pr}}$ for private and $\mathbf{N_{pu}}$ for public**.** $\mathbf{N_{pr}}$ and $\mathbf{N_{pu}}$ was used to divide the total sample size of the study into two according to the proportion of children from primary six to Junior high schools in the selected schools to get the school-specific sample sizes. In each school, a systematic random sampling was applied to select participants to participate in the study. The names of children from primary six to junior high school in the selected schools were arranged in alphabetical order to effectively carry out the systematic random sampling. To get the sampling interval, the total number of children from primary six to junior high school in the schools was divided by the estimated school-specific sample sizes. The sampling interval was used to select the participants. Parents of selected children were contacted with consent forms. The nature and purpose of the study was explained

to them in detail to get their approval for their children to become participants. The substitution criteria was that, if for some reason parents did not consent for their child to participate, the next child in the order was contacted to replace the omission.

3.4.1 Sample Size Determination

The sample size was determined using the Cochran's (1977), formula.

$$No = \frac{z^2 pq}{e^2}$$

No = minimum sample size

z = standard normal deviation (1.96)

p = 66.8% sedentary behavior among school children (Miquetichuc et al., 2016)

q = 1-0.668= 0.332

e = degree of precision, set at 5% = 0.05

Substituting, $N = \frac{(1.96)2 \times 0.668 \times 0.332}{0.05 \times 0.05}$

$$= \frac{3.8416 \times 0.668 \times 0.332}{0.05 \times 0.05}$$

$$= \mathbf{341}$$

This number was increased to **385** to make up for possible 10% non-response rate.

3.5. Inclusion Criteria

Eligible participants for this study were basic school children from primary six to junior high school, willing to provide answers to the study instrument and whose parents had given consent for participation of their child.

3.6 Exclusion Criteria

Children who could not speak or hear (deaf), had a mental health condition, and not in primary six to junior high school were excluded from the study.

3.7. Study Variables

The variables measured in the study were categorized into dependent and independent variables.

3.7.1 Dependent variable

The dependent variable measured in this study was sedentary behaviour. A participant was said to be sedentary if they spent ≥2 hours per day on an activity in the questionnaire used (SBQ) (Rey-López et al., 2008; Wosje et al.,2009). This was assessed using the sedentary behavior questionnaire (SBQ) of the University of California, San Diego. The questionnaire was modified to get responses on sedentary behavior in children since the SBQ has certain questions that pertain to sedentary behavior in adults.

3.7.2 Independent variables

Child Factors (Age, Sex, Educational level (class), Type of school)

Parental Factors (Mother's educational level, Mother's occupation, Father's educational level, Father's Occupation, Parental rules on screen time)

Environmental Factors (Sports facilities at home, Sports facilities in school)

3.8. Data Collection Methods and Instruments

Interviewer-administered structured questionnaire were used for data collection. For participants who did not understand English, the research assistants interpreted questions for the questionnaires to be filled. The questionnaire was divided into three sections: the first part assessed child factors that influence sedentary behaviour, the second part considered parental factors and he third part measured sedentary behaviour using the sedentary behavior questionnaire (SBQ) of the University of California, San Diego.

This part was modified to get responses on sedentary behavior in children since the SBQ had certain questions that are pertaining to sedentary behavior in adults.

The questionnaires were administered on a one on one basis. Each questionnaire was administered between 20 and 40 minutes.

3.9 Quality Control

1. Research assistants with a minimum qualification of West African Secondary School Certificate Examination (WASSCE) were trained for the study.
2. Data collected was assessed on daily basis to ensure that all information had been properly collected and the questionnaires appropriately filled.
3. There was double data entry to ensure accuracy.

3.10. Training of Research Assistants

Three research assistants were engaged in this study. They had a minimum qualification of West African Secondary School Certificate (WASSCE). They assisted in administration of the

questionnaires only. They were trained intensively for two days on the techniques of questionnaire administration for quantitative data collection and on the ethical guidelines.

3.11. Pretesting

The developed questionnaires were pre-tested at two other schools, one public and one private, in the Adenta Municipality that were not selected. 20 conveniently sampled children, 10 from each school, were selected. Of the 10 from each school, 5 were males and 5 females. The aim was to test for validity and reliability of the questionnaire. Identified anomalies in the questionnaire were corrected before the final data collection.

3.12 Ethical Consideration

Approval of the study was granted by Ghana Health Service Ethics Review Committee (GHS-ERC). Following this, permission was obtained from the Ghana Education Service-Adenta Municipality. Additionally, permission was sought from the authorities in the schools chosen before data was collected.

Participant consent

The study was explained to participants and their parents so that those who wished for their wards to partake in the study were approached to seek consent. Parents of the respondents were given a consent form to sign before their children partook in the study. For parents who lacked the ability to read, explanation of the purpose of the study was given to them in a language they understood with the help of interpreters and for those who agreed for their children to partake in

the study, their thumb prints were taken. The children also filled an assent form prior to participation.

Voluntary Consent

Parents and participants were allowed to voluntarily participate or opt out. Participants were told that they could opt out from the research if they wanted to and there were no penalties for voluntary withdrawal. No one was forced or threatened to partake in the study.

Confidentiality

All respondents were assured of confidentiality. Various measures were taken to ensure confidentiality. Privacy was ensured by allowing respondents to fill questionnaires individually and not in groups with their colleagues not having close contacts with them. Subject codes were used to hide respondents` identity and personal information that will make a respondent identifiable was not included in the questionnaire. Personnel involved in data collection were trained and cautioned to ensure these measures were taken throughout the study. Data collected was also stored in locked cabinets accessible by the principal investigator only.

Risk and Benefits

Respondents were assured that the research would not pose any foreseeable physical risk since they were not to be subjected to any life threatening activity. Partaking in the study came at no cost to them. However, their precious time was used to fill the questionnaire. The benefit of the study to the participant was awareness creation on what constitutes sedentary behaviour, the effects of sedentary behaviour and factors contributing to sedentary behavior and the need to reduce it.

Compensation

Each participant was compensated with a nice pen at a cost of GH¢2.

3.13 Data Analysis

The data collected was entered into excel. It was cleaned and imported into STATA (v15.0) for statistical analysis. Mean age of respondents was computed. Proportions of basic children who engage in sedentary behaviour were computed separately for weekdays and for weekends according to how sedentary behaviour was measured in the sedentary behaviour questionnaire. The cut point of ≥ 2h/day of engaging in a sedentary activity in the SBQ was used to categorize the outcome (Wiltgen et al., 2016).

Frequencies of socio-demographic variables or factors such as sex, educational level, occupation of parents (mothers and fathers), educational level of parents (mothers and fathers) and type of school were computed. A test of normality was conducted to determine the normality of age distribution which showed that age was not normally distributed hence age was categorized into three levels (10 – 12, 13 – 15, 16 – 18). Simple logistic regression was done to measure the strength and the direction of the association between all independent variables and sedentary behaviour. All variables, with ($p \leq 0.1$) were fitted into a final multiple logistic regression table to assess the strength of association looking at adjusted odds ratio with a 95% confidence interval. These were done separately for the outcomes, (i) sedentary behaviour on weekdays and (ii) sedentary behaviour on weekends.

CHAPTER FOUR

4.0 RESULTS

4.1 Socio-demographic characteristics of respondents

A total of 385 questionnaires were administered for data collection and were all retrieved successfully. The data were thoroughly cleaned and analyzed. Information on socio-demographic characteristics are shown below in Table 4.1. The mean age of respondents was 13.2 ± 1.3 years, range (11-18years) with 43.9% (169/385) above the mean age. Slightly more than half of the respondents were female 52.2% (201/385). More than half of the respondents were in Junior high school 83.6% (322/385). Public school respondents were in the majority 56.9% (219/385). Of the respondents, 32.7% (126/385) had their mother's involved in petty trading and 36.4% (140/38) had their father's in the civil service Majority of respondents 97.9% (377/385) had mothers and 99.7% (384/385) had fathers with some level of education as compared to those who had no formal education 2.1% (8/385) and 0.3% (1/385) respectively.

Table 4.1 Socio-demographic characteristics of respondents *(n=385)*

Variables		Frequency	Percent (%)
Mean age	**13.2 ± 1.3**		
Sex			
Male		184	47.8
Female		201	52.2
Educational level			
Class 6		63	16.4
Junior high school		322	83.6
School type			
Private school		166	43.1
Public school		219	56.9
Mother's occupation			
Unemployed		12	3.1
Petty trader		126	32.7
Business woman		105	27.3
Civil service		84	21.8
Other		58	15.1
Father's occupation			
Unemployed		4	1.0
Petty trader		21	5.5
Business man		138	35.8
Civil service		140	36.4
Labourer		4	1.0
Other		78	20.3
Mother's educational level			
No formal education		8	2.1
Primary		17	4.4
Junior high school		89	23.1
Senior high school		105	27.3
Tertiary		166	43.1
Father's educational level			
No formal education		1	0.3
Primary		2	0.5
Junior high school		56	14.6
Senior high school		80	20.8
Tertiary		246	63.9

4.2 Sedentary Behaviour on Weekdays

Out of the 385 respondents, 72.2% (278/385) of them showed sedentary behaviour on weekdays, (p = 72.2%, 95% CI = 67% – 76.6%).

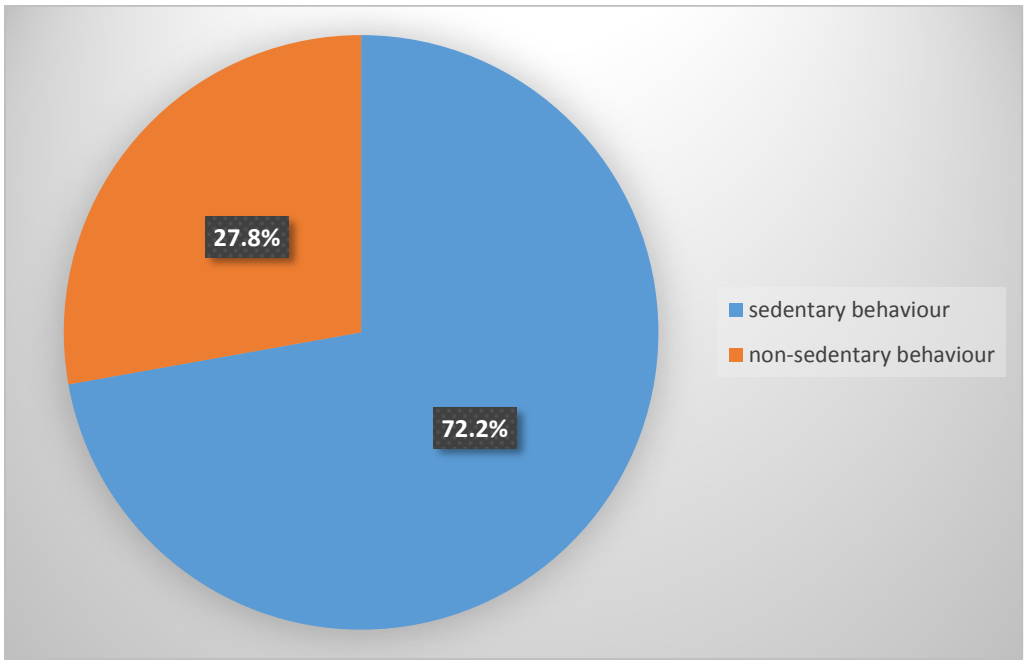

Figure 4.1 Sedentary behaviour on weekdays amongst respondents

4.3. Sedentary Behaviour on Weekends

Out of the 385 respondents, 84.9% (327/385) of them showed sedentary behaviour on weekends, (p = 84.9%, 95% CI = 80.9% – 88.4%).

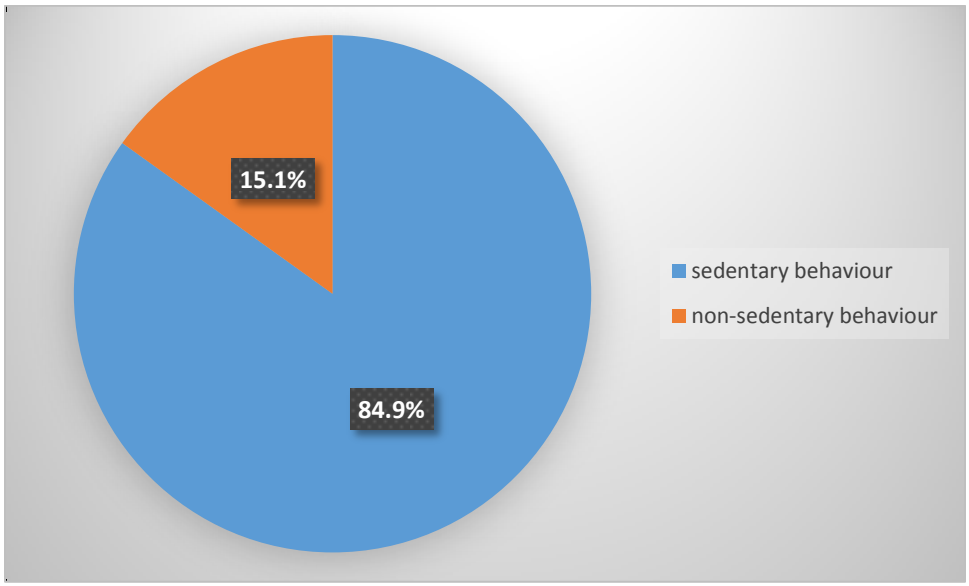

Figure 4.2 Sedentary behaviour on weekends amongst respondents

Table 4.2 displays distribution of time (no time, less than 2 hours or 2 hours or more) spent by children on specific sedentary activities on weekdays. Only 14.6% (56/385) do not spend any time watching television (VCR/DVD) and 40 % (155/385) of the children spent 2 hours or more watching television.

Of the participants, 50.4% (194/385) of the children do not play video games during weekdays whilst 38.5% (148/385) spent less than 2 hours playing video games. Only 11.2% (43/385) of the children spent more than 2 hours playing video games.

Majority of the children 62.2% (240/385) spent less than 2 hours sitting reading a book or magazine whilst 33.1% (127/385) spent more than 2 hours on this sedentary activity.

Table 4.2 Time spent on sedentary behavior during weekdays

Variables	None n (%)	Less than 2 hours n (%)	2 hours or more n (%)
Watching television (including videos on VCR/DVD)	56(14.6)	174 (45.1)	155 (40.3)
Playing computer or video games	194(50.3)	148 (38.5)	43(11.2)
Sitting listening to music on the radio, tapes, or CDs	125(32.6)	194(50.3)	66(17.1)
Sitting and talking on the phone	219(56.9)	136(35.4)	30(7.7)
Using your computer (computer games, internet browse, learning)	155(40.3)	145(37.7)	85(22.0)
Sitting reading a book or magazine	18(4.7)	240(62.2)	127(33.1)
Playing a musical instrument	273(70.9)	90 (23.4)	22(5.7)
Doing artwork or crafts, playing cards (hobbies)	155(40.2)	185(48.0)	45(11.8)
Sitting in a car, bus or train	115(29.9)	228(59.2)	42(10.9)

The distribution of time (no time, less than 2 hours or 2 hours or more) spent by children on specific sedentary activities on weekends is shown below in Table 4.3. Among the participants, 67.2(259/385) spent more than 2 hours of their time watching television, 25.5% (98/385) spent less than 2 hours, whilst 7.3% (28/385) did not spend their time watching television.

Those who spent more than 2 hours using their computer were 29.7% whilst 36.6% (141/385) did not spend any time using computers.

Slightly more than half of the children 59.3% (228/385) spent less than 2 hours reading a book or

magazine whilst 34.2% (132/385) spent 2 hours or more reading a book or magazine. Six percent (25/385) spent none of their time reading a book or magazine.

Table 4.3 Time spent on sedentary behavior during weekends

Variables	None n (%)	Less than 2 hours n (%)	2 hours or more n (%)
Watching television (including videos on VCR/DVD)	28(7.3)	98(25.5)	259(67.2)
Playing computer or video games	142(36.9)	142(36.8)	101(26.3)
Sitting listening to music on the radio, tapes, or CDs	92(23.9)	196(50.8)	97(25.3)
Sitting and talking on the phone	199(51.7)	144(37.4)	42(10.9)
Using your computer (computer games, internet browse, learning)	141(36.6)	130(33.7)	114(29.7)
Sitting reading a book or magazine	25(6.5)	228(59.3)	132(34.2)
Playing a musical instrument	249(64.7)	10126.2)	35(9.1)
Doing artwork or crafts, playing cards (hobbies)	154(40.0)	189(49.1)	42(10.9)
Sitting in a car, bus or train	149\(38.7)	184(47.7)	52(13.6)

4.4 Logistic regression analysis of factors associated with sedentary behaviour on weekdays

In order to investigate the strength of association between the socio-demographic characteristics and the factors associated with sedentary behaviour on weekdays, a simple logistic regression was fitted in order to compute estimates of the crude odds ratios. The logistic model from the point estimates of crude odds ratios and their confidence intervals showed that the most significant variables that could be associated with the factors that influence sedentary behaviour

on weekdays include; children in public schools (cOR = 0.6, 95% CI = 0.4 – 0.9; p = 0.037), fathers with junior high school education (cOR = 0.5, 95% CI = 0.3 – 0.9; p = 0.034) and fathers with senior high school education (cOR = 0.6, 95% CI = 0.3 – 0.9; p = 0.045).

Table 4.4 Factors Associated with Sedentary behaviour on Weekdays

Variables	Sedentary behaviour on weekdays		cOR (95% CI)	p-value
	sedentary behavior n = 278	non sedentary behavior n = 107		
Age categories				
10 – 12	82(78.1)	23(21.9)	Reference	
13 – 15	184(70.2)	78(29.8)	0.7(0.4 - 1.1)	0.129
16 - 18	12(66.7)	6(33.3)	0.6(0.2 - 1.7)	0.296
Sex				
male	135(73.4)	49(26.6)	Reference	
female	143(28.9)	58(28.9)	0.9(0.6 - 1.4)	0.626
Educational level				
class 6	51(80.9)	12(19.1)	Reference	
junior high school	227(70.5)	95(29.5)	0.6(0.3 - 1.1)	0.093
School type				
private school	129(77.7)	37(22.3)	Reference	
public school	149(68.0)	70(32.0)	**0.6 (0.4 - 0.9)**	**0.037**
Mother's occupation				
unemployed	8(66.7)	4(33.3)	Reference	
petty trader	91(72.2)	35(27.8)	1.3 (0.4 - 4.6)	0.684
business woman	78(74.3)	27(25.7)	1.4 (0.4 - 5.2)	0.573
civil service	62(73.8)	22(26.2)	1.4 (0.4 - 5.1)	0.604
other	39(67.2)	19(32.8)	1.02 (0.3 - 3.8)	0.969
Father's occupation				
unemployed	2(50.0)	2(50.0)	Reference	
petty trader	16(76.2)	5(23.8)	3.2 (0.4 - 28.9)	0.301
business man	103(74.6)	35(25.4)	2.9 (0.4 - 21.7)	0.289
civil service	102(72.9)	38(27.1)	2.7 (0.4 - 19.7)	0.332
labourer	3(75.0)	1(25.0)	3.0 (0.2 - 59.9)	0.472

other	52(66.7)	26(33.3)	2.0 (0.3 - 15.0)	0.500
Mother's education				
no formal education	5(62.5)	3(37.5)	Reference	
primary	12(70.6)	5(29.4)	1.4 (0.2 - 8.5)	0.687
junior high school	62(69.7)	27(30.3)	1.4 (0.3 - 6.2)	0.676
senior high school	76(72.4)	29(27.6)	1.6 (0.4 - 7.0)	0.553
tertiary	123(74.1)	43(25.9)	1.7 (0.4 - 7.5)	0.472
Father's education				
no formal education	1(100.0)	0(0.0)	1	
primary	2(100.0)	0(0.0)	1	
junior high school	35(62.5)	21(37.5)	**0.5 (0.3 - 0.9)**	**0.034**
senior high school	52(65.0)	28(35.0)	**0.6 (0.3 - 0.9)**	**0.045**
tertiary	188(76.4)	58(23.6)	1	
Parental rules				
yes	193(71.8)	76(28.2)	Reference	
no	85(73.3)	31(26.7)	1.1 (0.7 - 1.9)	0.579
Sports facilities in school				
yes	137(70.3)	58(29.7)	Reference	
no	141(74.2)	49(25.)	1.4 (0.9 - 2.1)	0.187
Sports facilities at home				
yes	160(71.1)	65(28.9)	Reference	
no	118(73.8)	42(26.2)	1.2 (0.8 - 1.9)	0.424

***statistically significant (p<0.05)**

4.5 Logistic regression analysis of factors associated with sedentary behaviour on weekends

In order to investigate the strength of association between the socio-demographic characteristics and the factors associated with sedentary behaviour on weekends, a simple logistic regression was fitted in order to compute estimates of the crude odds ratios. The logistic model from the point estimates of crude odds ratio and their confidence intervals showed that the most significant variables that could be associated with the factors that influence sedentary behaviour

on weekends include; children in public schools (cOR = 0.5, 95% CI = 0.3 – 0.9; p = 0.046), fathers who were business men (cOR = 8.2, 95% CI = 1.1 – 62.6; p = 0.042), fathers who had junior high school education (cOR = 0.5, 95% CI = 0.2 – 0.9; p = 0.046).

Table 4.5 Factors Associated with Sedentary behaviour on Weekends

Variables	Sedentary behaviour on weekends		cOR (95% CI)	p-value
	sedentary behavior n = 327	non sedentary behavior n = 58		
Age categories				
10 – 12	92(87.6)	13(12.4)	Reference	
13 – 15	221(84.4)	41(15.6)	0.8 (0.4 - 1.5)	0.425
16 - 18	14(77.8)	4(22.2)	0.5 (0.1 - 1.7)	0.271
Sex				
male	160(87.0)	24(13.0)	Reference	
female	167(83.1)	34(16.9)	0.7 (0.4 - 1.3)	0.290
Educational level				
class 6	55(87.3)	8(12.7)	Reference	
junior high school	272(84.5)	50(15.5)	0.8 (0.4 - 1.8)	0.567
School type				
private school	148(89.2)	18(10.8)	Reference	
public school	179(81.7)	40(18.3)	**0.5 (0.3 - 0.9)**	**0.046**
Mother's occupation				
unemployed	8(66.7)	4(33.3)	Reference	
petty trader	105(83.3)	21(16.7)	2.5 (0.7 - 9.1)	0.163
business woman	91(86.7)	14(13.3)	3.3 (0.9 - 12.2)	0.081
civil service	74(88.1)	10(11.9)	3.7 (0.9 - 14.6)	0.061
other	49(84.5)	9(15.5)	2.7 (0.7 - 10.9)	0.159
Father's occupation				
unemployed	2(50.0)	2(50.0)	Reference	
petty trader	17(80.9)	4(19.1)	4.3 (0.5 - 40.0)	0.206
business man	123(89.1)	15(10.9)	**8.2 (1.1 - 62.6)**	**0.042**
civil service	121(86.4)	19(13.6)	6.4 (0.8 - 47.9)	0.072
labourer	3(75.0)	1(25.0)	3 (0.2 - 59.9)	0.472
other	61(78.2)	17(21.8)	3.6 (0.5 - 27.4)	0.218
Mother's education				

no formal education	7(87.5)	1(12.5)	Reference	
primary	17(100.0)	0(0.0)	1	
junior high school	70(78.6)	19(21.4)	0.5 (0.06 - 4.5)	0.560
senior high school	91(86.7)	14(13.3)	0.9 (0.1 - 8.1)	0.947
tertiary	142(85.5)	24(14.5)	0.8 (0.09 - 7.2)	0.878
Father's education				
no formal education	1(100.0)	0(0.0)	1	
primary	2(100.0)	0(0.0)	1	
junior high school	43(76.8)	13(23.2)	**0.5 (0.2 - 0.9)**	**0.046**
senior high school	66(82.5)	14(17.5)	0.7 (0.3 - 1.4)	0.272
tertiary	215(87.4)	31(12.6)	1	
Parental rules				
yes	227(84.4)	42(15.6)	Reference	
no	100(86.2)	16(13.8)	1.2 (0.6 - 2.2)	0.647
Sports facilities in school				
yes	161(82.6)	34(17.4)	Reference	
no	166(87.4)	24(12.6)	1.3 (0.7 - 2.4)	0.303
Sports facilities at home				
yes	183(81.3)	42(18.7)	Reference	
no	144(90.0)	16(10.0)	1.7 (0.9 - 3.1)	0.080

***statistically significant (p<0.05)**

4.6 Multiple Logistic regression analysis of factors associated with sedentary behaviour on weekdays

After running the multiple logistic regression to determine association of each independent variable, adjusting for educational level of child, school type, and father's education, none of the factors was found to be significantly associated with sedentary behaviour on weekdays.

Table 4.6 Factors Associated with Sedentary behaviour on Weekdays

Variables	Sedentary behaviour on weekdays		cOR (95% CI)	p-value	aOR (95% CI)	p-value
	sedentary behavior n = 278	non sedentary behavior n = 107				
Age categories						
10 – 12	82(78.1)	23(21.9)	Reference			
13 – 15	184(70.2)	78(29.8)	0.7(0.4 - 1.1)	0.129		
16 - 18	12(66.7)	6(33.3)	0.6(0.2 - 1.7)	0.296		
Sex						
male	135(73.4)	49(26.6)	Reference			
female	143(28.9)	58(28.9)	0.9(0.6 - 1.4)	0.626		
Educational level						
class 6	51(80.9)	12(19.1)	Reference			
junior high school	227(70.5)	95(29.5)	0.6(0.3 - 1.1)	0.093	0.6 (0.3 - 1.4)	0.252
School type						
private school	129(77.7)	37(22.3)	Reference			
public school	149(68.0)	70(32.0)	**0.6 (0.4 - 0.9)**	**0.037**	0.9 (0.5 - 1.7)	0.916
Mother's occupation						
unemployed	8(66.7)	4(33.3)	Reference			
petty trader	91(72.2)	35(27.8)	1.3 (0.4 - 4.6)	0.684		
business woman	78(74.3)	27(25.7)	1.4 (0.4 - 5.2)	0.573		
civil service	62(73.8)	22(26.2)	1.4 (0.4 - 5.1)	0.604		
other	39(67.2)	19(32.8)	1.02 (0.3 - 3.8)	0.969		
Father's occupation						
unemployed	2(50.0)	2(50.0)	Reference			
petty trader	16(76.2)	5(23.8)	3.2 (0.4 - 28.9)	0.301		
business man	103(74.6)	35(25.4)	2.9 (0.4 - 21.7)	0.289		
civil service	102(72.9)	38(27.1)	2.7 (0.4 - 19.7)	0.332		
labourer	3(75.0)	1(25.0)	3.0 (0.2 - 59.9)	0.472		
other	52(66.7)	26(33.3)	2.0 (0.3 - 15.0)	0.500		
Mother's education						

no formal education	5(62.5)	3(37.5)	Reference			
primary	12(70.6)	5(29.4)	1.4 (0.2 - 8.5)	0.687		
junior high school	62(69.7)	27(30.3)	1.4 (0.3 - 6.2)	0.676		
senior high school	76(72.4)	29(27.6)	1.6 (0.4 - 7.0)	0.553		
tertiary	123(74.1)	43(25.9)	1.7 (0.4 - 7.5)	0.472		
Father's education						
no formal education	1(100.0)	0(0.0)	1			
primary	2(100.0)	0(0.0)	1			
junior high school	35(62.5)	21(37.5)	**0.5 (0.3 - 0.9)**	**0.034**	0.6 (0.3 - 1.1)	0.118
senior high school	52(65.0)	28(35.0)	**0.6 (0.3 - 0.9)**	**0.045**	0.7 (0.4 - 1.2)	0.167
tertiary	188(76.4)	58(23.6)	1			
Parental rules						
yes	193(71.8)	76(28.2)	Reference			
No	85(73.3)	31(26.7)	1.1 (0.7 - 1.9)	0.579		
Sports facilities in school						
yes	137(70.3)	58(29.7)	Reference			
No	141(74.2)	49(25.)	1.4 (0.9 - 2.1)	0.187		
Sports facilities at home						
yes	160(71.1)	65(28.9)	Reference			
No	118(73.8)	42(26.2)	1.2 (0.8 - 1.9)	0.424		

4.7 Multiple Logistic regression analysis of factors associated with sedentary behaviour on weekends

After running the multiple logistic regression to determine association of each independent variable in the adjusted model, the absence of sports facilities at home was found to be significantly associated with sedentary behaviour on weekends. In that, the odds of engaging in

sedentary behaviour on weekends was significantly 1.9 times as high among the children who did not have any sports facility at home compared to those who had some sports facility at home holding all other variables constant (aOR = 1.9, 95% CI = 1.02 – 3.8).

Children in public schools had 60% significant reduction in their odds of engaging in sedentary behaviour as compared to children in private schools (aOR = 0.4, 95% CI = 0.2 – 0.9).

The odds of engaging in sedentary behaviour on weekends among children who had mother's involved in petty trading was significantly 6.6 times as high compared to children whose mothers were unemployed (aOR = 6.6, 95% CI = 1.3 – 33.1). Also, the odds of engaging in sedentary behaviour on weekends among children who had mother's in the civil service was significantly 4.9 times as high compared to children whose mothers were unemployed (aOR = 4.9, 95% CI = 1.01 – 23.9).

Table 4.7 Factors Associated with Sedentary behaviour on Weekends

Variables	Sedentary behaviour on weekends		cOR (95% CI)	p-value	aOR (95% CI)	p-value
	sedentary behavior n = 327	non sedentary behavior n = 58				
Age categories						
10 – 12	92(87.6)	13(12.4)	Reference			
13 – 15	221(84.4)	41(15.6)	0.8 (0.4 - 1.5)	0.425		
16 – 18	14(77.8)	4(22.2)	0.5 (0.1 - 1.7)	0.271		
Sex						
Male	160(87.0)	24(13.0)	Reference			
female	167(83.1)	34(16.9)	0.7 (0.4 - 1.3)	0.290		
Educational level						
class 6	55(87.3)	8(12.7)	Reference			
junior high school	272(84.5)	50(15.5)	0.8 (0.4 - 1.8)	0.567		
School type						
private school	148(89.2)	18(10.8)	Reference			
public school	179(81.7)	40(18.3)	**0.5 (0.3 - 0.9)**	**0.046**	**0.4 (0.2 - 0.9)**	**0.025**
Mother's occupation						
unemployed	8(66.7)	4(33.3)	Reference			
petty trader	105(83.3)	21(16.7)	2.5 (0.7 - 9.1)	0.163	**6.6 (1.3 - 33.1)**	**0.022**
business woman	91(86.7)	14(13.3)	3.3 (0.9 - 12.2)	0.081	2.9 (0.7 - 12.4)	0.162
civil service	74(88.1)	10(11.9)	3.7 (0.9 - 14.6)	0.061	**4.9 (1.01 - 23.9)**	**0.049**
Other	49(84.5)	9(15.5)	2.7 (0.7 - 10.9)	0.159	5.6 (1.09 - 28.1)	0.038
Father's occupation						
unemployed	2(50.0)	2(50.0)	Reference			
petty trader	17(80.9)	4(19.1)	4.3 (0.5 - 40.0)	0.206	4.0 (0.3 - 50.8)	0.279
business man	123(89.1)	15(10.9)	**8.2 (1.1 - 62.6)**	0.042	6.5 (0.7 - 64.3)	0.109
civil service	121(86.4)	19(13.6)	6.4 (0.8 - 47.9)	0.072	5.2 (0.5 - 50.3)	0.156
labourer	3(75.0)	1(25.0)	3 (0.2 - 59.9)	0.472	2.9 (0.1 - 73.5)	0.516
Other	61(78.2)	17(21.8)	3.6 (0.5 - 27.4)	0.218	2.7 (0.3 - 27.9)	0.393
Mother's education						
no formal education	7(87.5)	1(12.5)	Reference			
primary	17(100.0)	0(0.0)	1			
junior high school	70(78.6)	19(21.4)	0.5 (0.06 - 4.5)	0.560		

senior high school	91(86.7)	14(13.3)	0.9 (0.1 - 8.1)	0.947		
tertiary	142(85.5)	24(14.5)	0.8 (0.09 - 7.2)	0.878		
Father's education						
no formal education	1(100.0)	0(0.0)	1			
primary	2(100.0)	0(0.0)	1			
junior high school	43(76.8)	13(23.2)	**0.5 (0.2 - 0.9)**	**0.046**	0.9 (0.4 - 2.3)	0.845
senior high school	66(82.5)	14(17.5)	0.7 (0.3 - 1.4)	0.272	0.9 (0.4 - 2.2)	0.92
tertiary	215(87.4)	31(12.6)	1			
Parental rules						
Yes	227(84.4)	42(15.6)	Reference			
No	100(86.2)	16(13.8)	1.2 (0.6 - 2.2)	0.647		
Sports facilities in school						
Yes	161(82.6)	34(17.4)	Reference			
No	166(87.4)	24(12.6)	1.3 (0.7 - 2.4)	0.303		
Sports facilities at home						
Yes	183(81.3)	42(18.7)	Reference			
No	144(90.0)	16(10.0)	1.7 (0.9 - 3.1)	0.080	**1.9 (1.02 - 3.8)**	**0.042**

CHAPTER FIVE

5.0 DISCUSSION

The study aimed to determine prevalence of SB among basic school children as well as child (sex, age, school type, class), parental (screen time rules, maternal education and occupation, paternal education and occupation) and environmental factors (presence of sports facilities at home and in school) that could be associated with SB.

This study demonstrated that most children have sedentary lifestyle throughout the week with 72.2% of school children being sedentary on a typical weekday and 84.9% on weekends. This is comparable with what a study among primary and secondary school children in Brazil found showing that a high proportion of children were sedentary with a prevalence of 69.2% on weekdays and 79.6% on weekends (Wiltgen et al., 2016). The prevalence of sedentary behaviour was 66.8% among school children 14-18years in another study in Brazil (Miquetichuc et al., 2016). WHO (2012), also reports 60% to 85% of people in the world being sedentary, this study shows similar percentages which is consistent with that of the world. Hence, measures like strict screen time guidelines, restriction on possession of screen gadgets must be in place to control SB.

No sociodemographic factor was found to show a significant association with sedentary behaviour on weekdays in this study. With regards to child factors, sex was not significantly associated with sedentary behaviour in this study. This was found to be consistent with what Davies, Greenfield and Edwards (2016) found in another study. However, sedentary lifestyle was more in females than males in both public schools and private schools in one study in Brazil (Miquetichuc et al., 2016). It has been found that boys engaged more in screen time based

sedentary acitivities in one study (Klitsie et al., 2013). This study could not make such findings probably due to the fact that the questionnaire did not assess possession of screen gadgets.

Miquetichuc et al. (2016) reported that sedentary lifestyle prevalence does not differ among students in public and private schools. Also, school type was not significantly linked with sedentary behaviour, after adjustment was made for the other variables (Davies, Greenfield, & Edwards, 2016).

However, children in private schools have been found to be more sedentary than those in public schools (Augusto & Jesus, 2010). This is similar to the findings in this study where children in public schools have a sixty percent reduction in the odds of being sedentary.

After adjusting for other variables in this study, children with mothers involved in petty trading and civil service had a higher likelihood of being sedentary on weekends in this study. In another study however, having a mother who works, appeared to have reduced likelihood of being sedentary in overweight primary school-age children (Vázquez-nava et al., 2013). Also, children with working mothers were less sedentary than those whose mothers were unemployed in one study (Vicente-rodriguez et al., 2018). Furthermore, according to Manuscript & Work (2015), children with mothers who engage in longer durations of work have records of longer durations of screen time.

This study yielded no relationship between sedentary behaviour and maternal education. Low maternal educational level however appeared to be associated with sedentary lifestyle in overweight children within the primary school age bracket (Vázquez-nava, Treviño-garcia-manzo, Vázquez-rodríguez, & Vázquez-rodríguez, 2013).

This research did not establish an association between parental rules on screen time and sedentary lifestyle. Parental rules on screen time had no influence on whether a child was sedentary or not. This could probably be due to lack of enforcement on rules and guidelines by parents in the study population. On the contrary, Roberts, Rodkey, Ray, Knight and Saelens (2017) found that absence of parental rules on electronic screen time could significantly predict children's Sedentary Behaviour. Children with no rules regulating how long they used screen gadgets were found to be more sedentary (Roberts et al., 2017). Furthermore, parental rules limiting television viewing was proven to reduce time children spent watching television significantly (Roberts et al., 2017). Hence parental rules generally contributed to lower levels of screen time.

After adjusting for all factors, not having sports facilities at home was found to increase the likelihood of being sedentary in this study on weekends. Lack of sports facilities probably provided an option for children to spend more time with screen devices rather than being physically active. This is consistent with findings in other studies where the home environment has been found to be an important factor that influences sedentary behaviour (Maitland, Stratton, Foster, Braham, & Rosenberg, 2013).

In addition, most children admitted in a face to face interview that presence of parks, play grounds within their neighborhoods and proximity to their homes as well as activity equipment being present were factors that influenced whether they will engage more in screen time or physical activities and games (Veitch et al., 2018).

Children in schools with parks and recreation centers, recorded lower levels of SB in one study (Crosatti et al., 2016). Furthermore, Morton et al. (2016) found that having play grounds in

schools minimises sedentary tendencies. Hence intervention measures that promote sports facilities are likely to limit SB.

Common activities children engage in as SB patterns include playing video games, using computers and watching television for more than 2 hours daily according to Rey-López, Vicente-Rodríguez, Biosca and Moreno (2008). These findings are consistent with what this study found. This study identified the following as common sedentary activities in children; watching television, using computer to browse and play video games and sitting to read. In another study, using automobiles, reading, sitting and lying down have been found to be some common sedentary lifestyles children practice (de Rezende, Rey-López, Matsudo, & do Carmo Luiz, 2014).

This research has added valuable information to scientific literature on sedentary lifestyle in Ghanaian children. Further studies may be needed to assess other factors like restriction on possession of screen gadgets and other factors that most likely will promote active lifestyles.

5.1 Limitations of the Study

1. The study did not analyse average duration of engagement in sedentary behavior per day.

2. The questionnaire did not make room for parents and guardians to have an input on the sedentary lifestyle pattern of their children.

3. Sedentary activities were self-reported and based on recall and this could probably contribute to information bias.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

From this study, there was a high prevalence of SB on weekdays and weekends with a higher observation especially on weekends. The use of screen devices like television, computer and to some extent sitting to read for long periods appeared to be contributing to most of the children being sedentary.

The absence of sports facilities in homes, the type of maternal occupation as well as was the type of school a child attends has an association with sedentary trends. Hence major interventions to limit SB must be directed at addressing these factors.

6.2 Recommendations

Following the study, the following recommendations have been made:

1. Parents should engage in physical activity at home and encourage their children to engage more in physical activities as well at home rather than engaging in the use of screen gadgets for prolonged periods.

2. There should be education on the health effects of sedentary lifestyle, the need to minimize them and the benefits of being physically active in schools, communities and the media.

3. Parents are to enforce screen time rules and guidelines for their children to minimise time spent on screen devices in and out of home.

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APPENDICES

SCHOOL OF PUBLIC HEALTH

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Appendix A: Informed Consent Form

Title: **FACTORS ASSOCIATED WITH SEDENTARY BEHAVIOUR AMONG BASIC SCHOOL CHILDREN IN ADENTA MUNICIPALITY, GREATER ACCRA REGION**

Principal Investigator: Dr. ESTHER SERWAA AGYEI-KWAKYE

My name is Dr. Esther Serwaa Agyei-Kwakye. I am a graduate student from the University of Ghana, School of Public Health undertaking a research on factors associated with sedentary behaviour in basic school children in Adenta municipality. Some research assistants will be assisting in the study. The study seeks to find out the various factors that may influence sedentary behavior in your child. Participants are required to share their experiences with sedentary activities by responding to questions.

Personal information that will make you or your child identifiable will not be included in the questionnaire. Questionnaire to be responded to by participants will be anonymous (will not bear names of participants) so you will not be identified. You are free to be part of the study and decide to leave at any point you want.

No one will be upset if you decide not to allow your child to partake in the study. However, be assured that your privacy and confidentiality will be respected. Be assured that the research come

at no risk and no cost except the precious time that they will used to fill the questionnaire. You can choose a place of convenience to answer the questions.

VOLUNTEER AGREEMENT

The above document describing the benefits, risks and procedures for the research title –**FACTORS ASSOCIATED WITH SEDENTARY BEHAVIOUR AMONG BASIC SCHOOL CHILDREN IN ADENTA MUNICIPALITY, GREATER ACCRA REGION**" has been explained to me.

I have read or have had someone read all of the above, asked questions, received answers regarding participation in this study, and am willing to give consent for my child to participate in this study as a volunteer.

_____ _____

Date Name and Signature or mark of volunteer

If volunteers cannot read the form themselves, a witness must sign here:

I was present while the nature and purpose of this study were read to the volunteer. All questions asked were answered satisfactorily regarding participation in this study, and volunteer gave consent for his/her child to participate in this study.

_____ _____

Date Name and Signature or mark of witness

I certify that the nature and purpose in this research have been duly explained to the above individual.

_____ _____

Date Name and Signature of Person Who Obtained Consent

Appendix B: Assent Form

My name is Dr. Esther Serwaa Agyei-Kwakye. I am a graduate student from the University of Ghana, School of Public Health undertaking a research on factors associated with sedentary behaviour in basic school children in Adenta municipality. Some research assistants will be assisting in the study. The study seeks to find out the various factors that may influence sedentary behavior in children. You are required to share your experiences with sedentary activities by responding to questions in the form of a questionnaire. You can seek for clarification from research assistants.

If you decide to be in the study, no one will be told your responses to the questions and if you decide to opt out, no one will be mad at you. Even after starting, you can choose to stop later if you want.

Participant's name…….

Signature or thumb print of participant……..

Signature of investigator……

Date……..

CONTACTS FOR ADDITIONAL INFORMATION

If you have any further clarification, contact Dr Esther Serwaa Agyei-Kwakye on 024-685-6389.

In case of any concern you can contact the Ethics Administrator, Ms. Hannah Frimpong, GHS/ERC on 024-599-7061.

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Appendix C: Questionnaire

QUESTIONNAIRE ON FACTORS ASSOCIATED WITH SEDENTARY BEHAVIOUR IN BASIC SCHOOL CHILDREN IN ADENTA MUNICIPALITY, GREATER ACCRA REGION	
This is a research on **FACTORS ASSOCIATED WITH SEDENTARY BEHAVIOUR IN BASIC SCHOOL CHILDREN IN ADENTA MUNICIPALITY, GREATER ACCRA REGION**.	

	QUESTIONS	CODING CATEGORIES	SKIP TO	CODES
1.	**CHILD FACTORS**			
a.	Sex	**Male……..….1** **Female……2**		SEX
b.	Age (State your last birthday age)	……		AGE
c.	Educational level (class)	**CLASS 6……..1** **JHS…….2**		EDUC

d.	Type of school	**Private School……1** **Public School……..2**		SCH_TYPE
2. **PARENTAL FACTORS**				
e.	Mother's Occupation	**Unemployed……0** **PettyTrader/……..1** **Business woman……2** **Civil service……3** **Labourer……....4** **Other……5**		MOCCP
f..	Father's Occupation	**Unemployed……0** **Petty Trader……..1** **Business man……...2** **Civil service……3** **Labourer……4** **Other……5**		FOCCP
g..	Mother's educational level	**None……..0** **Primary……..1** **JHS……2** **SHS……3** **Tertiary……4**		MEDUC
h.	Father's educational level	**None……..0** **Primary……..1** **JHS……2**		FEDUC

		SHS……3 **Tertiary…….4**		
i.	Do your parents have rules on how much time you can spend watching TV, playing video games or using your computer?	**Yes……1** **No……..……2**		P_RULES

SEDENTARY BEHAVIOR: Weekday

How much time do you spend (from when you wake up until you go to bed) doing the following per day?

		NONE	**15 min or less**	**30 min**	**1hr**	**2hr**	**3hr**	**4hr**	**5hr**	**6hr or more**
1.	Watching television (including videos on VCR/DVD).									
2.	Playing computer or video games.									
3.	Sitting listening to music on the radio, tapes, or CDs.									
4.	Sitting and talking on the phone.									
5.	Using your computer (computer games, internet browse, learning)									

6.	Sitting reading a book or magazine.									
7.	Playing a musical Instrument									
8.	Doing artwork or crafts, playing cards(hobbies)									
9.	Sitting in a car, bus, or train.									

SEDENTARY BEHAVIOR: Weekend Day

How much time do you spend (from when you wake up until you go to bed) doing the following ON A WEEKEND DAY?

		NONE	**15 min or less**	**30 min**	**1hr**	**2hr**	**3hr**	**4hr**	**5hr**	**6hr or more**
1.	Watching television (including videos on VCR/DVD).									
2.	Playing computer or video games.									
3.	Sitting listening to music on the radio, tapes, or CDs.									
4.	Sitting and talking on the phone.									
5.	Using your computer (computer games, internet									

	browse, learning)									
6.	Sitting reading a book or magazine.									
7.	Playing a musical instrument									
8.	Doing artwork or crafts									
9.	Sitting in a car, bus, or train.									

QUESTIONS

1. Do you have sports facilities in your school? YES…. NO….

2. Do you have sports facilities at home. YES…… NO……