

**PHYSICAL ACTIVITY, GENDER, SOCIO-ECONOMIC STATUS AND DIET
OF STUDENTS IN PRIVATE BOARDING SECONDARY SCHOOLS IN
UASIN-GISHU COUNTY, KENYA**

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SCIENCE (PHYSICAL EDUCATION) IN THE SCHOOL OF HEALTH
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NOVEMBER, 2022

DECLARATION

This thesis is my original work and has not been presented for a degree in any other university or institution for consideration.

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DEDICATION

I am eternally grateful to the Almighty God for His grace and patience. This thesis is dedicated to my loving mother, Esther Jepng'etich Kipkemei, who has always encouraged me to work hard and has made many sacrifices to support my academic journey.

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LIST OF ABBREVIATIONS AND ACRONYMS

BMI	Body Mass Index
CVDs	Cardiovascular Diseases
MVPA	Moderate to Vigorous Physical Activity
NCDs	Non-Communicable Diseases
PA	Physical Activity
PAQ	Physical Activity Questionnaire
PE	Physical Education
SES	Socio Economic Status
SPSS	Statistical Package for the Social Sciences
VPA	Vigorous Physical Activity
WHO	World Health Organization

OPERATIONAL DEFINITIONS OF TERMS

Adolescents: A young population comprising individuals aged between fourteen and eighteen.

Lifestyle: An individual's way of life.

Non-Communicable diseases: Conditions that cannot be transferred from one person to another, also known as chronic diseases.

Physical activity: Movements created by skeletal muscles which led to energy expenditure positively associated with physical aptness.

Physical Inactivity: The lack of physical activity that leads to negative impact on health.

Sedentary Lifestyle: Sitting or lying down with little or no physical activity.

Socio Economic Status: The comparative economic and social position of an individual or a family on the basis of income, education and occupation.

ABSTRACT

Physical activity is crucial to an individual's health at all stages of life. Regular physical activity provides numerous health related benefits to adolescents. A person's gender, socio-economic status (SES) and dietary habits may influence participation in physical activity. This study, therefore, sought to assess physical activity and its association with factors such as gender, SES and diet among the students aged 14 to 18 years in private boarding schools within Uasin-Gishu County, Kenya. The dependent variable examined was participation in physical activity, whereas the independent variables were gender, socio-economic status, and diet. The study used the cross-sectional research design. The study's target population were the 936 students registered in private boarding schools in Uasin-Gishu County. The Fisher's formula was used to determine the sample size. Stratified sampling procedure was used to select the schools. Random sampling was then used to select the 196 participating sample. The Physical Activity Questionnaire for adolescents (PAQ-A) and diet questionnaire was used to collect data from the participants. Data on Socio-Economic Status and diet was obtained using SES and diet questionnaires. Statistical Package for Social Scientists (SPSS) software version 22.0 was used in coding and analysing the collected data. The reliability of the instrument was determined using the Cronbach's reliability coefficient. With a score of 0.7, the instrument was deemed reliable. Descriptive statistics such as standard deviations, frequencies and percentages were used to obtain descriptive results. Pearson's correlation analysis was used to test the relationships between variables. The level of significance was set at 0.05. Results revealed that the parents' socio-economic status has no influence ($r = .009$, $p=0.903$) on the students' level of participation in physical activity. The results showed that gender has a significant effect ($r = .204$, $p =0.007$) on the level of participation in physical activity. The study also established that the students' diet has an influence ($r = .546$, $p=0.208$) on their participation in physical activity. The results of the study suggest that private boarding schools need to prioritize policies that promote PA among adolescents in schools. There is special need to increase physical activity, especially among girls because cultural and particular gender norms prevent them from participating in PA.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Physical activity (PA) is the behaviour involving body movement resulting from contraction of the skeletal muscle that results in physiological changes such as improved physical fitness and increased energy expenditure (Gabriel et al.,2012). Physical activity is vital for an individual's health at all stages of life. Wen et al.,(2011) established that regular PA lowers the risk of cardiovascular diseases and mortality. PA prevents chronic diseases such as diabetes, hypertension, cancer, and stroke while also promoting psychological and cognitive well-being (Nazzari et al., 2016). World Health Organization (WHO) advocates that children and youth involve themselves in moderate to intense physical activity for at least an hour daily (WHO, 2020).

Globally, there has been an increase in physical inactivity among school-going children and teenagers (Ortega et al.,2013). Physical inactivity is a health risk for non-communicable diseases (NCDs) such as hypertension, osteoporosis, diabetes, colon, and breast cancers (Jekauc et al., 2012). According to Chen et al, (2014) lack of vigorous physical activity (VPA) leads to high numbers of people who are overweight and obese worldwide. Choukem et al., (2020) linked physical inactivity to overweight and obesity, as well as an increase in cardiovascular disease in Sub-Sahara Africa, indicating the need for immediate interventions to promote physical activity in adolescents. More so, Janssen and Leblanc, (2015) noted the extent to which school children participate in physical activities should be examined so that improved benefits for children and youth will be realized and the intensity of PA is increased.

Past research has shown that if PA is not encouraged among students, the impact on life could later turn out to be fatal (Fazah et al.,2010). In addition, sedentary lifestyles may continue into adulthood if students do not engage in increased PA at school (Aznar et al., 2011). The progression from primary to secondary school is a critical period in children's lives in terms of their PA behaviour (Jekauc et al., 2012). It is assumed that the students who are engaged in vigorous PA tend to continue with the practice to higher levels of education.

Bauman et al, (2012) highlighted age, gender, health status, and motivation as the predominant factors affecting adolescents' PA. In many instances, variables that have been studied for their influence on levels of physical activity includes age, gender, grade, parental socio-economic status (SES) and diet (Ferreira et al., 2016). Therefore, in order to reduce serious future consequences of sedentary lifestyles and non-communicable diseases in developing countries, it is imperative to assess and understand the determinants of PA.

Physical Activity declines with age. Adolescents' PA in secondary school is not the same as when in primary school (Jekauc et al., 2012). Students younger than 13 years of age have a higher PA than their older counterparts (Rezende et al., 2014). These results concur with international data on the prevalence of PA. They are supported by international data published in the 2013 Lancet PA Series which state that 80 per cent of adolescents aged 13-15 years do not achieve the PA recommendations of one hour of moderate to intense PA per day (Micklesfield et al., 2012). This highlights the need for adolescents across the globe to engage in more PA.

Research shows that there are gender differences in PA participation, with women falling short of the recommended PA levels (Chen et al., 2014b; Rajappan et al., 2015). Girls are less likely to meet WHO-recommended physical activity levels than boys because they encounter more perceived barriers to physical activity (Rosselli et al., 2020). Studies by Dan et al., 2011; Reilly, 2016 established that boys are more physically active than girls. Other studies showed disparity in the time spent on PA between males and females (Hobin et al., 2012; Ishii et al., 2015). The studies found that boys engaged in more physical activity and were more likely to achieve PA guidelines than girls. One possible cause for women being less active could be an increase in body fat at puberty, which may decrease aerobic power and discourage participation (Malina et al., 2004; Eisenmann et al., 2011). Women's increased body fat makes it more difficult for them to engage in PA. As a result, there is a tendency to avoid physical activity, which leads to additional body fat accumulation and a decrease in the desire to participate (Cumming et al., 2011).

Quality diet and physical activity have a positive relationship with health (Guillamon et al., 2017). Arora et al., (2012) noted that healthy diet among students is associated with higher PA. Lazarou et al., (2010) affirm that children who adhere to healthy diet are likely to participate in high intensity PA. A study of Saudi Arabian adolescents reported that a healthy diet is related to PA and eating habits affects sedentary lifestyle (Al-Hazza et al., 2014). Poor quality diet is considered the key to PA disengagement (Bibiloni et al., 2012). It is assumed that adolescents are likely to resort to unsafe dietary habits while being sedentary (Pearson et al., 2012). Furthermore, Kelishadi et al., (2007) argued that when analysing the health benefits of PA, the relationship between diet and PA

behaviours should be taken into account. Conversely, Vissers et al., (2012) found no clear correlation between diet and physical activity in children.

Research has suggested a socio-economic approach to adolescent participation in PA (Meester et al., 2012). Hankonen et al., (2017) and Heradstveit et al., (2020) revealed health behaviour disparities and the strongest correlation between SES and PA. De Corker et al., (2011) observed that PA patterns in adolescents differ by socio-economic status (SES). Their findings are in agreement with those of Oyeyemi et al., (2016), who argued that children from families with high social status are likely to have more leisure time and overall PA. On the other hand, students whose parents are better educated are less likely to become sedentary (Chen et al., 2014). High SES in adolescents contributes to less active transport to and from school; and more time spent on screen (Muthuri et al., 2014). Other studies have found that higher SES is associated with higher levels of physical activity in children and adolescents, particularly when the Family Affluence Scale and the mother's education level are used as SES measures (Ke et al., 2022). Conversely children from low SES are actively involved in PA, like walking to school and doing household chores (Micklesfield et al., 2012). However, according to Kelly et al., (2006) and Ajman et al., (2019) SES is not a significant indicator of physical activity or sedentary behaviour.

1.2 Statement of the Problem

Studies examining association between PA and health-related behaviours among 14 to 18 year old students have established that sedentary lifestyles are associated significantly with poor health (Vingilis et al., 2002; Aarnio et al., 2002; Breidablik et al.,

2008 ; Department of Health in UK, 2011; WHO, 2015). Regrettably, it appears a majority of adolescents do not attain the recommended PA guidelines of one hour of moderate to intense physical activity per day (American Heart Association, 2015; WHO, 2020). Worse still, the Lancet Physical Activity Series Working Group found that 80.3% of 14-18-year-old adolescents did not meet the WHO recommended daily PA levels (Hallal et al., 2012).

Evidence from a 2003-2012 systematic review of PA adequacy has shown that developing countries have the highest levels of inadequate PA (De Moraes et al., 2013). There is a consistent correlation between poorer income and inadequate PA indicating that the lower the income, the higher the rates of physical inactivity (Dumith, Hallal & Reis, 2011).

Literature indicates that there is PA transition in Kenya. The 2016 Kenya PA Report Card for children and youth reported satisfactory results on PA levels. According to the report, most children and youth were active. Nevertheless, it was recommended that the Kenyan government draws up strategies to counter the emerging PA transformation (Onywera et al.,2016). In an earlier study, Onywera et al., (2012) noted that there is manifestation of PA transition among Kenyan children and youth thus, requiring data on PA and interventions to prevent sedentary lifestyles. The study observed that more urban children engaged in sedentary activities than their rural counterparts. Despite Kenyan adolescents having low sedentary time and healthy body composition, most of them do not meet the WHO daily PA requirements (Wachira et al.,2014).The current study sought to investigate this phenomenon by establishing the association between physical activity,

gender, SES and diet among high school students (14-18 years of age) in private schools in Uasin-Gishu County.

1.3 Purpose of the Study

The purpose of the study was to examine the association between physical activity and the factors of gender, SES and diet among students aged between 14 and 18 years in private boarding schools in Uasin-Gishu County.

1.4 Objectives of the Study

The study was guided by the following objectives:

- i. To determine the relationship between gender and participation in physical activity among high school students aged 14-18 in private boarding schools in Uasin-Gishu County.
- ii. To establish the relationship between parental socio-economic status and physical activity participation among high school students aged 14-18 years attending private boarding schools in Uasin-Gishu County.
- iii. To determine whether participation in PA among high school students aged 14-18 years in private boarding schools in Uasin-Gishu County was associated with diet.

1.5 Hypotheses

This study was guided by the following null hypotheses:

H0₁ There is no significant relationship between gender and participation in physical activity among high school students aged 14-18 years in private boarding schools in Uasin-Gishu County.

H0₂ There is no significant relationship between parental SES and participation in physical activity among high school students aged 14-18 years in private boarding schools in Uasin-Gishu County.

H0₃ There is no significant relationship between diet and PA participation among 14 to 18 years old students in private boarding schools in Uasin-Gishu County.

1.6 Significance of the Study

The study was expected to reveal PA behaviour among 14 to 18 year old students at private boarding schools in Uasin-Gishu County Kenya. The study's findings could be used to create interventions for physical activity programmes that encourage students in Private boarding schools to be physically active and promote good health.

Furthermore, the results of this research could contribute to a better understanding of PA levels among Kenyan adolescents in private boarding schools in Kenya. It may, for example, add scientific data on PA among Kenyan students in private boarding schools to the existing literature. The findings may necessitate the creation of awareness among private school teachers and administrators concerning factors that are likely to reinforce PA.

The study provided insights that can contribute significantly to policy development for private boarding secondary schools that do not emphasize physical activity participation

among adolescents and do not prioritize PA programs that can prevent health-related problems later in life.

1.7 Delimitations of the Study

The study was delimited to the use of questionnaires as the primary source of data collection from the students in private boarding schools in Uasin-Gishu County. Focus was on students in private boarding schools in Uasin-Gishu County in Kenya. Further, the target population was delimited to adolescent boys and girls aged between 14-18 years. Therefore, the outcome of the study cannot be generalised to the whole Kenyan adolescent population.

1.8 Limitation of the Study

The study focused on diet, SES and gender as influencers of PA levels. Other factors such as psychological factors like motivation, body image, perceived benefits, self-efficacy and attitude, that influence PA as discussed by other scholars, did not form part of the current study.

1.9 Assumptions of the Study

It was assumed that the participants in the study understood the rationale for engaging in PA and the benefits accrued. In addition, the study also assumed that the participants understood that socio-demographic characteristics influence participation in PA.

1.10 Conceptual Framework

The study was based on elements of the youth physical activity model (Welk, 1999). The model explains factors that predispose, reinforce and enable people to participate in physical activity. Predisposing factors are variables that increase the ability to be physically active. Adolescent participation in physical activity is supported by reinforcement of factors such as SES and diet.

Studies show that SES influences adolescent PA. Muthuri et al., (2014), Oyeyemi et al., (2016) and Piola et al., (2019) associated high SES with sedentary lifestyles, low PA levels and more screen time. Conversely, high SES has a positive impact on PA participation. La Tore et al., (2006), Veselska et al., (2011) and Seabra et al., (2011) noted that children whose parents are educated, have high self-esteem and are more actively engaged in PA. Study by Nunes et al., (2016) showed that children from low income backgrounds are likely to be sedentary. However, Swaminathan et al., (2011); Ajman et al., (2019) and Haddad and Sarti (2020), all indicated that SES may not have an impact on PA.

This adapted model from Welk, (1999) included demographic factors such as age and gender. Gender differences in PA participation have been documented. Male adolescents are more likely to be active, while female adolescents tend to be sedentary (Peltzer, 2010; Lenhart et al., 2012; Gibson et al., 2013; Nakabazzi et al.,2020). Other studies found girls to be more active than boys (Ramos et al., 2013;Kalio et al.,2020). Predisposition to PA is supported by biological factors such as physical fitness and skills. In addition, age may have an impact on PA participation, as seen in the declining PA levels among adolescents

(Jekauc et al., 2012). The independent variables of gender, parental Socio-Economic Status and diet were assumed to influence the levels of PA among students aged 14 to 18 years (dependent variables).

Adolescents' dietary patterns are linked to PA (Neta et al., 2021). Healthy dietary habits are associated with more physical activity (Al-Hazzaa et al., 2015). Ros et al., (2019) noted that adolescents who had balanced diet were more likely to engage in PA.

The conceptual framework pointed out that gender, socio-economic status and the diet in private boarding schools has an impact on their level of involvement in physical activity. The probability that a student would engage in any form of PA depended on their relationship to these variables. Figure 1.1 presents an illustration adapted from Welk, (1999) showing how these factors interact.

Independent Variables

Dependent Variable

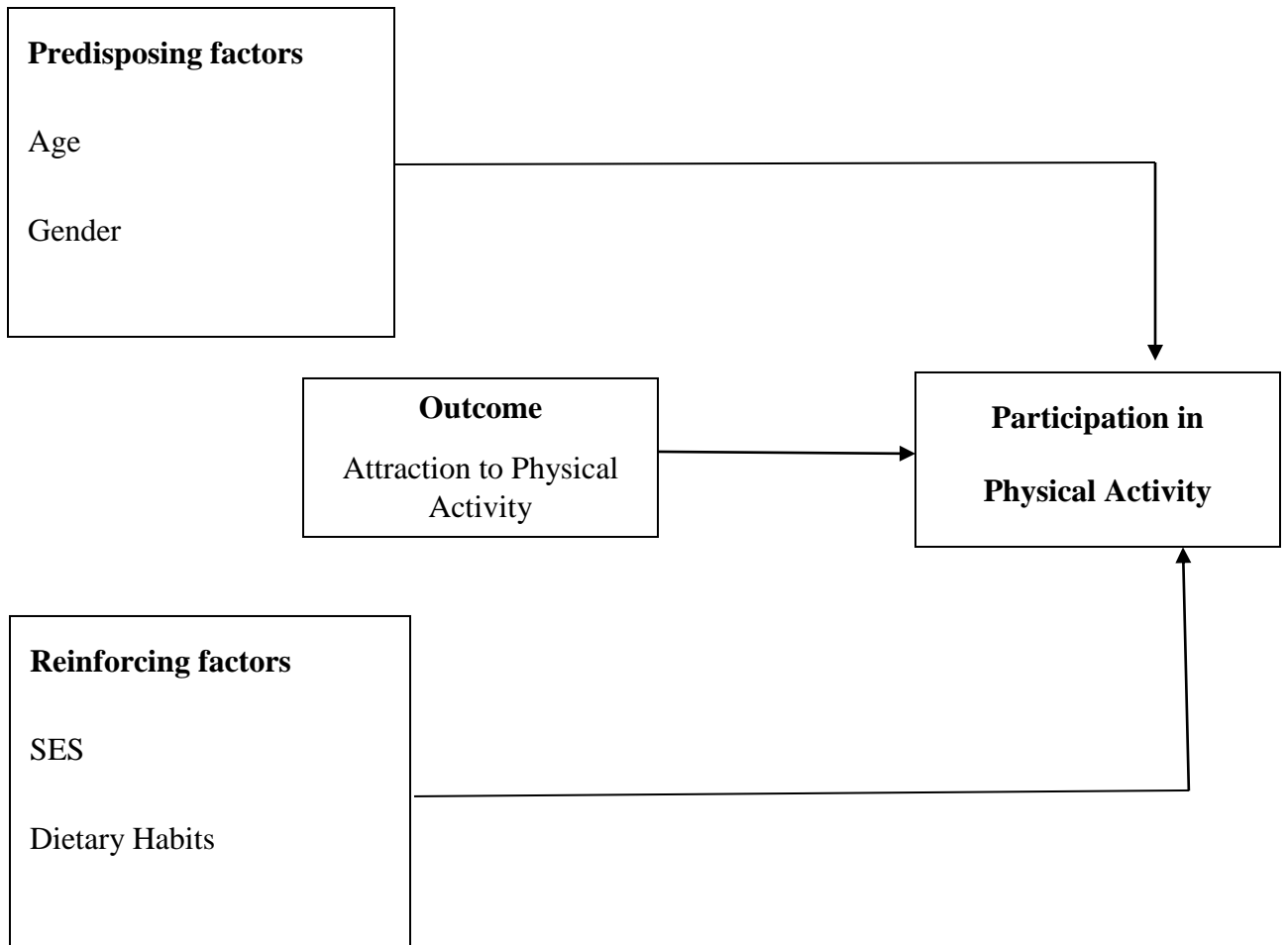


Figure 1.1: Youth Physical Activity Promotion model (Adapted from Welk, (1999))

CHAPTER TWO: LITERATURE REVIEW

2.1 Physical Activity

Pishon (2009) defines PA as the aspects relating to bodily movements that result from the energy produced by the skeletal muscles when energy in the body is burned above the basal level. Day to day physical activity can be categorised into conditioning, sports, occupational, household and other activities (Piggin, 2020). The current study defines Physical activity as any movement occurring during leisure, Physical Education (PE) lessons and activities such as walking and jogging or movement from place to place.

2.2 Measurement of Physical Activity

According to Warren et al., (2010) there are two methods that can be used to assess the levels of PA. They are subjective self-reports like questionnaires, direct recalls, logs and diaries; or use of impartial measures like heart rate monitors, pedometers and accelerometers. Self-report procedures are commonly used when assessing the levels of PA in children and adolescents, because they can be given easily to big populations at very low costs (Kowalski et al., 1997). Objective measures of PA are regarded more precise and not disposed to recollection biases (Adamo et al., 2009). However, objective methods such as accelerometers and pedometers provide limited information about the type of activity (Murphy, 2009). PAQ-A has been used by researchers to assess adolescent physical activity levels (De Cocker et al., 2011; Bibioni et al., 2012; Jimoh, 2016; Guthold et al., 2018; Oyeyemi et al., 2016). According to (Kowalski et al., 2004), the Physical Activity Questionnaire for Adolescents (PAQ-A) is a reliable and valid measure for high school students.

2.3 Recommendations for Physical Activity for Children and Adolescents

Universal recommendations for PA for health were published by World Health Organization (WHO, 2020). Adults are required to accumulate a total of 150 minutes each week of moderate PA while children and adolescents should engage in PA of about 30 to 60 minutes three to five times in a week. These guidelines stipulate that adolescents will accrue health benefits by engaging in PA more than 60 minutes daily. Aerobic and vigorous intensity activities should be included 3 times a week. Regular PA provides adolescents with numerous health-related benefits (US Department of Health and Human Services, 2008). A study by Corder et al., (2015), found that decline in PA poses health risks to the adolescents. The WHO (2020) Global report stated that 81% of teenagers aged 11-17 years were inactive. Data on PA in Africa indicate that prevalence rates vary widely. Mozambique and Mali registered 95% of low PA while West African countries had lowest prevalence of physical inactivity of 50% (Guthold et al., (2011).

Adolescents have high prevalence of physical inactivity. The Dias et al., (2014) study on factors associated with sedentary behaviour, revealed that adolescents, especially those with undesirable dietary patterns, spent 300 minutes per week on PA. Arundell et al., (2016) noted that adolescents were more inactive than children. Most of their time was spent in watching TV, reading and doing homework.

Global Matrix Physical Activity Report Card published low grades and worrying trends in PA engagement among adolescents and children. The findings emphasized the importance of families, schools and communities to join together to avert sedentary behaviour and create opportunities for PA participation (Aubert et al.,2018). According

to Salmon and Cardon's (2020) study on worldwide trends in physical activity among adolescents, physical inactivity is still prevalent, and there has been no improvement in adolescents' PA over the last decade.

Evaluation of the PA levels of children in Kenya and Canada suggested transformation of physical activity in Kenya. Kenya reported adequate PA levels and lower childhood obesity levels compared to Canada (Muthuri et al., 2014b). Although Kenyan children reported lower sedentary time and recommended body weight, most did not comply with the WHO PA guidelines (Wachira et al., 2014). Adolescents especially in urban areas in Kenya, spent considerable time in sedentary activities (Ojiambo et al., 2012). This is attributed to the impact of urbanisation on lifestyles. Pedometer determined PA assessment of school children in Western Kenya, showed lower rates of PA (Croteau et al., 2011). It was noted that the children attending private schools were physically active. Though the Western Kenyan study shares similar objective with the current study in the population, the Western Kenyan study examined pedometer-assessed PA in school children. Variation of research methods is therefore, useful for generating new insights into the PA participation among adolescence. Larsen et al., (2004) established that adolescent boys in a village in Western Kenya attained the recommended PA levels when in secondary school compared to those in urban areas.

Objectively measured physical activity among the Pokot Kenyan pastoral adolescents and adults aged 14 to 78 on the other hand, revealed that they were very active from adolescence to old age. The subjects spent a significant amount of time on MVPA (Sayre et al., 2019). Furthermore, men and younger participants were extremely active. This

study differs from the current study in that the Pokot study used wrist-worn Actigraph accelerometers to assess PA in people aged 14 to 78.

2.4 Adolescents and Physical Activity

International review established that there is a decline in PA during adolescence (Dumith et al., 2011). Age is a predominant biological factor of PA in adolescents (Nelson et al., 2005; Cameron et al., 2011). Despite well-known benefits of PA, it is worrying to discover that children and adolescent PA duration and intensity reduce with age. Studies, concerning adolescent PA, often reveal decline in the PA levels as children grow in age (Sallis & Taylor, 2000). A comprehensive review by Corder et al., (2019) reported that PA reduces between adolescence and young adulthood, and that MVPA was lower in adulthood than in adolescence. Another investigation of PA trends among children and adolescents indicate that PA declines with increasing age. Booth, Rowlands, & Dollman, (2015) in their longitudinal study among south Australian students, reported increased sedentary behaviour in children aged 9-15 years. In a related study, (Marques & De Matos, 2014) observed that PA plummeted with age. Significant decline in PA with increasing age has been noted among girls and boys (Marques & De Matos, 2014). The same study added that the number of participants in various sporting activities decreased over time.

In yet another study on adolescent leisure time PA showed decline of PA over time, especially among girls aged 15-18, who were also at high risk of poor mental health (Hoegh et al., 2016). A national study of PA and BMI in children and adolescents found that PA decreases in adolescence. While younger children met the daily PA

recommendations, physical inactivity was more prevalent in older children and girls (Chung et al., 2012). Students aged 15 Years or younger reportedly engage in higher PA at school. Interestingly, boys below 13 years and those attending private schools recorded high levels of physical activity (Rezende *et al.*, 2014).

A study in South Africa involving 14 to 18-year old school going adolescents reported a decline in the levels of PA with progressing pubescent positions (McVeigh & Meiring, 2014). An age-related differences in PA and depressive symptoms population study by Baldursdottir et al., (2017) showed that as age increased there was a decline in PA, with most adolescents in upper secondary schools not attaining the required PA levels. Physical activity, tracked using accelerometers in Swedish children over a period of two years, revealed decreasing PA with age from 10-12 years, (Dencker et al., (2013). Reduced intensity and substantial amount of time spent doing sedentary activities was evident among boys.

A two-year longitudinal study of English children's physical activity and sedentary behaviour revealed significant changes in PA. Although the MVPA was initially low, the percentage of time spent inactive increased over time. PA decreased in those with a high BMI and in females (Basterfield et al., 2011). Similarly, Harding et al. (2015) reported that objectively quantified inactivity increased between 12-15 years of age. Time spent in sedentary behaviour increased during-school, after school and weekends. Correspondingly, Brodersen et al., (2007) associated adolescence period with decline in PA; inactivity being more noticeable between the 11-12 and 15-16 aged; ,and girls were less active than boys; thus revealing a pronounced higher decline in PA in girls.

2.5 Selected Determinants of PA among Adolescents

Participation in PA among adolescents is influenced by various factors (Biddle et al., 2011). These include socio-cultural factors like peer and parental modelling and support; environmental factors such as distance from home to school, access to facilities, neighbourhood characteristics; and individual elements like age, gender, ethnicity and SES (Sallis et al., 2000; Biddle et al., 2011; Alexandra et al., 2014). Studies also show that psychological factors like motivation, body image, perceived benefits, self-efficacy and attitude towards an activity are associated with PA (Dunton et al., 2007; Park & Kim, 2008; Tyng et al., 2020). The current study focused on the three factors of SES, gender and dietary habits.

2.5.1 Gender and Physical Activity

Studies indicate gender disparity in PA participation. Early maturation among adolescent girls hampers participation in PA (Cumming et al., 2011). There is inconsistency about the time spent in PA among girls and boys (Hobin *et al.*, 2012) though a study among University students in Malaysia showed acceptable PA levels, the percentage for PA among female students was lower (Rajappan *et al.*, 2015). Based on the physical inactivity indicators of BMI, age and body weight, another study, involving Malaysian school going adolescents, found that girls were at a higher risk for inactivity (Baharudin et al., 2014). Other studies have confirmed that girls have higher level of sedentary lifestyle than boys (Aznar et al., 2011; Ferraira et al., 2016). The studies also suggested

that girls, who enjoyed electronic games and participants in higher grades were more sedentary than those in lower grades.

According to the Lenhart et al., (2012) study on gender disparities in physical activity levels among American adolescents, there was a higher likelihood of PA among boys than girls, with this association being more noticeable in the more active group as opposed to the sedentary group. Results of Lenhart et al., (2012) suggested that participation in team sports and playing during PE lessons contributed differently to PA levels among boys and girls. A pedometer study, done in rural South Africa, established that young boys aged 9-11 were more physically and aerobically active than older boys aged 11-14; and that girls were more active than the boys (Minnaar et al., 2016). A review of gender differences in PA and nutritional status among youth in eight countries in Sub-Saharan Africa reported that females were unlikely to exercise for more than one hour in a day and were, therefore at risk of being overweight (Darling et al., 2020). This review was similar to the current study with regard to methodology.

The Hubbard et al., (2016) research on health-related behaviours and parental education, seems to corroborate that girls were more sedentary. They were less active during school time, weekdays and weekends. Thus, adding confirmation to findings by other scholars who observed a higher prevalence of Physical inactivity in female adolescents. Konstabel et al., (2014) and Nunes et al., (2016) pointed to higher prevalence of Physical inactivity among female adolescents compounded by unhealthy dietary habits.

Inactive behaviour among female was evident from a Chinese investigation into association between PA and sedentary behaviour among adolescents. Although male

students were engaged in sedentary behaviours such as watching Television and computer use, they were more physically active than female students (Chen et al., 2014). Similarly, in a survey using International Physical Activity Questionnaire (IPAQ) to assess gender differences in perceived barriers to PA among adolescents, Rosselli et al., (2020) established that girls were less likely to achieve the WHO recommended physical activity levels. The study by Rosselli et al., (2020) is similar to the current cross-sectional study with regard to methodology, in establishing PA participation in high school students.

Correspondingly, both, Chen et al., (2018 and Jabeen et al.,(2018,) reported that boys, especially those with parental support, were physically active. On the other hand, girls studying in private schools lacking parental support for PA and a playground were not active. The current study has similarities with the target population of school going children aged 10-18.

Examination of PA changes in Finnish adolescents during the week and on weekends revealed a higher decline in PA, particularly on weekends, and increased sedentary behaviour among boys (Kallio et al., 2020). The study's findings revealed that MVPA was lower in boys but not in girls. Furthermore, a two-year follow-up period showed that the difference in MVPA between girls and boys had not changed. Gender differences in PA participation was also noted by Kopcakova et al., (2014) who found that boys with negative body image were more sedentary than other boys. Undesirable body image among girls, on the other hand, had no effect on their physical activity. These findings were reinforced by Ramos et al., (2013) who observed a greater increase in vigorous

physical activity (VPA) among girls in England and Spain. In addition, being involved in weight management regimens was not associated with adopting a healthy lifestyle.

Assessment of levels of physical activity and daily energy expenditure in Kenyan male and female adolescents in Nandi region revealed that boys were more active and girls walked farther to school than boys (Gibson et al., 2013). The current study differed from the Gibson study with regard to materials, methods, and research design. Another study that assessed socio-demographic factors and accelerometer-measured PA in school-aged children in Kampala, Uganda found that most children aged 10-12 did not attain the recommended PA guidelines. In particular girls, overweight children and those studying in private schools, lagged in PA levels (Nakabazzi et al., 2020). This study, like the current one, used a cross-sectional design, but the population was different because it focused on primary school children aged 10 to 12.

According to the Ssewanyana et al., (2018) investigation in to sedentary lifestyles and unhealthy diet among adolescents in coastal Kenya, girls expressed concerns about exposing their body parts during games and physical activities; ,while those who were overweight were also embarrassed about their body weight, both of which hampered participation in PA.

The current study sought to assess gender differences in PA levels of 14 to18 year old adolescents in private boarding schools in Uasin-Gishu region of Kenya.

2.5.2 Physical Activity and SES

Parental SES is linked to PA engagement in adolescents. Research on prevalence of PA among school children in Israel found positive relationship between PA and social class. Children from lower SES backgrounds had lower level of PA patterns (Kalusuki et al., 2009). Nunes et al., (2016) also linked low SES with Physical inactivity. According to Nunes et al., adolescents from low SES backgrounds consumed excess alcohol, unhealthy diet and were more sedentary. Other studies among European children (Lämmle et al., 2012 and Fernández-Alvira et al., 2013) found that children from low-income families had low PA, little sleep, and spent the majority of their time on screens.

Doku et al., (2013) investigated the impact of socio-economic differences on PA and diet of Ghanaian adolescents aged 12-15 and 16-18. The results found that father's higher educational level and substantial wealth are associated with more PA. The authors also observed that adolescents from higher SES were more likely to be physically active and having higher self-esteem. Further, Seabra et al., (2011) acknowledged that high SES is associated with high PA. Findings of the latter survey revealed that adolescents from higher SES backgrounds were actively involved in physical activities; and mothers and siblings who participate in PA, had a great influence on adolescents active lifestyle. La Torre et al., (2006) confirmed positive association between families SES and adolescents PA. Results of their study showed that parental education level influenced participation in extra-curricular activities in school children aged 11-17.

On the contrary, Hardianto et al., (2020) in their research on the PA levels among adolescents, found that participants from higher SES backgrounds reported low physical

activity levels with more than two-thirds being overweight or obese. Additionally, Muthuri et al., (2014) also linked higher SES to high sedentary behaviour, low PA levels, more screen time and low aerobic fitness especially among children in an urban setting.

Similarly, Ferreira et al., (2016) also found sedentary behaviour to be more prevalent among primary and secondary school students, and students from higher SES. Likewise Piola et al., (2019), reported positive association of high SES with insufficient PA and high screen time among adolescents, especially among girls.

Participation in physical activity may not be influenced by SES. Interestingly, Kelly et al., (2006) observed that SES does not have an impact on sedentary behaviour and PA. Another study involving Indian adolescents, established that SES had no effect on PA participation (Swaminathan et al., 2011). Along with that, an examination of socio-demographic determinants of health behaviours among Brazilian adolescents by Haddad & Sarti, (2020) showed insufficient effects of SES in adopting healthy lifestyles. Ajman et al (2019) in their investigation into PA and SES in secondary school students did not find any significant relationship between SES and PA. They found that boys were more physically active than girls; but family support did not affect physical activity in adolescents. Some studies show that differences in adolescents PA is unlikely to be associated with SES because children are independent and make their own choices without being affected by their parents' social class (Bauman ,2000; Stalsberg & Pedersen, 2010).

Conversely, a study by Micklesfield *et al.* (2014) concerning PA patterns among adolescents living in poor rural communities in South Africa revealed that lower maternal SES is connected to reduce sedentary time and low moderate to vigorous physical activity (MPVA) in schools. Results from a European teenage study involving PA interventions among adolescents from high and low SES, showed increased MVPA in low SES adolescents, while high SES had no significant effect on physical activity (De Bourdeaudhuij *et al.*, 2011). Wachira *et al.*, (2014) reported that children from lower SES backgrounds had higher levels of PA; this was particularly true among children in lower SES public schools. The current study sought to establish whether there was an association between parental socio-economic status and participation in physical activity among adolescents aged between 14-18 years in Uasin-Gishu County.

2.5.3 Dietary Habits and Physical Activity

Food choice has been connected to sedentary behaviour. Bibiloni *et al.*, (2012) indicated that adolescents who consumed fresh fruits, cereals and fresh fruit juice were active; while those who took high fat foods and soft drinks engaged in sedentary behaviour. Active adults and children incorporated fruits, cereals and vegetables' in their diet (Bellisle, 1999). A study involving Saudi Arabian adolescents reported positive relationship with PA and an influence of poor eating habits on sedentary behaviour (Al-Hazzaa *et al.*, 2014). The same study revealed significant relationship between PA and consumption of milk, vegetables, fruits and French fries/potato chips. Conversely, high screen time was reported among adolescents who took high sweetened drinks, cakes, doughnuts, fast food and energy drinks. Additionally, Arora *et al.*, (2012) confirmed that adolescents who ate breakfast daily were not overweight, had healthy dietary behaviours

and were more physically active. The breakfast included fruits, vegetable and dairy products.

Separate investigations by Kelishadi *et al.*, (2007) and Pérez-Rodrigo *et al.*, (2017) into dietary patterns and lifestyles among Iranian and Spanish adolescents and children, revealed poor diet connection to low PA and unhealthy lifestyles. A sedentary lifestyle is associated with a poor diet consisting of excessive alcohol consumption, fast foods, and snacks. It was evident from these two studies that children and adolescents who were most active had healthy dietary habits, high consumption of fruits and vegetables that resulted in high PA levels among the subjects. Both, boys and girls, who took dairy products frequently, were very active. Kelishadi *et al.*, 2016 like the current study, used a self-administered questionnaire but, their sample was from students aged 6 to 18.

Diet that is rich in vegetables, fruits, legumes, nuts, unsaturated fats and fish (Mediterranean) is associated with healthy lifestyles and high physical activity (Ros, 2019). Study by Ros (2019) linked sedentary behaviour to unhealthy diet that contains highly refined foods and sweetened beverages. School children, who were more active adhered to a sensible diet irrespective of their weight status, both overweight and normal weight subjects, observed healthier diets than those who were sedentary.

A study about food consumption patterns, overweight, obesity and physical activity among secondary school students in Nigeria, associated eating behaviour to PA in adolescents. The findings denoted that PA and the Body Mass Index (BMI) status of the participants was influenced by food consumption and engagement in physical activity that decreased their overweight status (Jimoh, 2016). Alkahtani *et al.*, (2015) found that

more fruit, dairy and vegetable intake resulted in increased MVPA in college students. Diet of the participants that met daily physical activity recommendations included frequent consumption of vegetables and fruits. Although the study assessed diet and physical activity in the same way as the current study, it was conducted on a different population of university students.

A South African based study on dietary behaviours and physical activity among adolescent girls, established that healthy eating habits were associated with more PA. The girls were actively involved in an array of physical activities within the school, home and community. The activities included football, walking and household chores. Participants were knowledgeable about healthy diet and incorporated fruit and locally grown traditional foods in their meals (Sedibe et al.,2014). This South African study differed from the current study because it focused exclusively on girls aged 16-19, while the current study included boys and girls.

Other studies have shown no association between diet and PA. Bak-Sosnowska & Skrzypulec-Plinta (2012), highlighted that children aged 14-15 took part in PA regardless of the type and number of meals in a day. Children actively participated in team games and during PE classes despite some of them not having eaten breakfast. This assessment pointed out that 70% of the students had sandwiches and 45 % bought snacks from the school shop yet they were often engaged in PA. Similarly, results of an evaluation of lifestyle behaviour and physical activity among urban secondary school students in Botswana did not show any relationship between eating habits and PA (Sinombe, 2018).

In contrast to the current study, which used a cross-sectional design, the Botswana study used a descriptive research design.

Analysis of gender differences in eating habits and physical activity among adolescents in Kuwait by Badr et al., (2019) reported unhealthy BMI, increased overweight/obesity and high sedentary behaviour in the subjects. According to the study, 48 % of the participants were overweight. Despite more boys consuming healthy diet, more were likely to be obese. About 20.7% of the adolescents engaged in PA for more than 60 min in a day, majority of those who were physically active, were boys. Study by Uusi-ranta, (2020) on the association of diet and PA in Nairobi, pre-adolescents found a weak negative association between MVPA and consumption of meat, fast food and snacks. Dairy products and plant proteins had no relationship with PA, while traditional Kenyan foods had no significant association with time spent on sedentary activities. The current study differed from the Nairobi study in that the study population was adolescents, whereas the Nairobi study was pre-adolescents.

Scholars from various countries have studied the relationship between diet and PA, but there have been few studies on diet and PA in Kenyan adolescents. Therefore, the current study sought to address the knowledge gap by investigating the relationship between diet and PA among students in private boarding schools in Uasin-Gishu, Kenya.

2.6 Gender, SES, and Diet Studies in Adolescents Physical Activity

Oyeyemi et al., (2016) study that evaluated patterns and associated factors of PA among adolescents aged 12 -18 years in Nigeria found that PA levels varied according to gender, age and SES. An adapted IPAQ-A was used to collect data. Results showed PA of 1525

(minutes/week) at school. The study also reported that 37% of the students engaged in 60 minutes of moderate PA daily. It was also revealed that girls did more PA at school than boys. This study is related to the current study because it targeted school going adolescents; and used an adapted version of PAQ-A to collect data in Kenya.

An examination of PA levels among University students aged 18-30 years by Rajappan et al., (2015) showed satisfactory levels of PA among students, with female students, however, registering lower PA levels than males. PA levels were assessed using IPAQ. Results revealed gender disparity in PA participation. The study documented higher levels of PA among students aged 22-25 years. The current Kenya study can relate to the Indian study because both examined gender and PA participation. The major difference being that the Indian study targeted University Students aged 18-30 years, the current Kenyan study sought to establish levels of PA in Secondary School adolescents aged 14-18 years.

Micklesfield et al., (2014) investigated PA and sedentary behaviour among rural 11-12 and 14-15 year old South African adolescents drawn from a sample of 3511. Time spent in School, Club MPVA and sedentary behaviour was predicted by maternal, household and community SES. A questionnaire quantifying duration and frequency of PA domains and sedentary activity for 12 months was used to collect data. Results indicated that SES, maternal education and puberty are instrumental in sedentary behaviour, Club Sport and School Physical activity. In addition, boys reported higher physical activity at school. The time spent on sedentary lifestyle was higher among girls and the group aged (14-15) than in the 11-12 year old.

There is similarity between the South African study and the current Kenyan study in involving adolescents. However the current Kenyan study was based in an urban area, targeting adolescents aged 14-18. On the other hand, the South African study was done in a rural area with adolescents stratified by ages (11-12 years) and (14 -15 years).

A review of correlates of PA, sedentary behaviour, temporal trends and physical fitness by Muthuri et al., (2014) among 5 to 17 year old school children in Sub-Saharan Africa, found that urbanization contributed to an emerging trend of low PA and fitness as well as high sedentary behaviour. Children in urban areas exhibited higher sedentary activity levels than the rural children. The study revealed higher levels of PA among low SES children. The Muthuri review revealed deficiency of data regarding PA, sedentary behaviour and physical fitness among school aged children in Sub-Sahara Africa. It used varied tools such as, Diet and lifestyle questionnaire, Demographic and Family health Questionnaire, and Neighbourhood questionnaire, to obtain data. The Muthuri review and the current study have some similarities in the variables, the study reviewed SES and gender and physical activity participation, and the current study assessed the association between SES and PA participation. However, the Muthuri study differed from the current study because it included children and youth aged 5-17.

According to Arora et al., (2012), adolescents who took breakfast daily were not overweight, had healthy eating habits, and were more physically active. Their breakfast included Fruits, vegetables, and dairy products. Results of this study indicated that breakfast consumption was linked to high PA, perception about healthy eating and positive values. In terms of research methodology, the study is related to the current

research. The Arora study examined the relationship between diet and physical activity among high school students using a cross-sectional design. The current study and the Arora study have different target populations. The latter targeted students from private and public schools, whereas the current research collected data from private schools only.

2.7 Summary of Literature Review

According to the reviewed literature, there is insufficient data about adolescents' physical activity in Kenyan secondary schools, particularly private boarding schools. Most of the reviewed studies are based in developed country and middle income contexts. The majority of reviewed Kenyan studies targeted public and private primary and secondary schools. Furthermore, some the studies focused on overweight and obesity and physical activity in school-aged children and adolescents. Also, there was no data to review on factors associated with PA participation among students in Uasin-Gishu County private boarding schools.

Published research studies on physical activity in Kenya cited adolescent PA transition from urbanisation and lifestyle changes that require immediate intervention. Establishing factors associated with PA participation in adolescents is critical to identifying and addressing the cause of transformation. Literature showed that studies have been conducted to explore the influence of Parental SES on PA. A key finding is that parental SES influence PA in adolescents. However, there are no specific studies in Kenya to ascertain association between SES and PA. It was evident that there is no study on PA conducted in Kenyan private boarding schools in Uasin-Gishu County. Therefore, there is

need to determine factors associated with PA, which may be instrumental in developing decision-making programmes to prevent sedentary lifestyles in adolescents.

The study looked at the relationship between gender, diet, and physical activity. The majority of the studies reviewed revealed that boys were less sedentary than girls. Also, researchers in the reviewed studies linked adolescent PA to dietary habits. Unfortunately, insufficient research has been conducted in Kenya to document the relationship between gender, diet, and PA in adolescents. As a result, the study sought to generate local evidence by establishing a link between physical activity, gender, socioeconomic status, and diet among students in private boarding schools in Uasin-Gishu County.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

The study used cross-sectional descriptive research design to explain PA levels. Cross-sectional studies allow the researcher to assess the level of physical activity participation at one point in time on the basis of observations (Portier et al., 2000). This design allows a comparison of the different characteristics of the study population (Grimes & Schulz, 2002). In addition, the design enables the researcher to observe two or more variables and to establish the relationship between or among these variables (Kothari, 2004). The design was considered appropriate for assessing PA participation among high school adolescents aged 14-18 years in Uasin-Gishu County.

3.2 Measurement of Variables

There were two main variables that were of concern in this study. The independent variables of gender, socio-economic status, and diet which influence the PA participation among 14 – 18 year old students in private boarding schools in Uasin-Gishu County of Kenya. The dependent variable for this study was PA.

Gender was determined using nominal measurement. Participants were asked to indicate whether they were a boy or a girl. The Number (1) was used to label boys while number (2) was used for girls. Parental SES was measured using family's social position. The Social position was evaluated based on the parent's education level, employment status and employment type. Diet variable was determined by the frequency of consumption of selected foods. Physical activity questionnaire for adolescent (PAQ-A) was used to measure PA.

3.3 Study Area

The study was carried out in the county of Uasin-Gishu, Kenya. Uasin-Gishu is divided into six Sub-Counties: Ainabkoi, Moiben, Soy, Turbo, Kapsaret and Kesses. Apart from being the administrative centre of Uasin Gishu County and Rift Valley region Eldoret town also serves as the capital of Uasin-Gishu County. Eldoret is a cosmopolitan town with robust industrialisation. It is experiencing rapid urbanisation and population growth. From a socio-economic perspective, residents include low, middle-and high-class people. Urban residents are engaged in business while others are in formal employment. The majority of the rural population is engaged in farming.

Eldoret is considered a sports hub. Athletics is the most popular sport in the region since it is home to many renowned Kenyan runners. Other common sporting teams include Eldoret Falcons, the town's women's football team in the national league and Eldoret Rugby Football Club (RFC), a men's national league rugby team.

Data from the County Education office indicates that there are about 15 tertiary institutions; 158 secondary schools and over 770 primary schools, of which 39 are private secondary boarding schools. Uasin-Gishu was the ideal choice for the study because there are many learning institutions. Physical activity may be influenced by factors such as urbanisation, various sporting activities, and different economic dimensions.

3.4 Target Population

The target population comprised 936 students aged between 14-18 years. The students were enrolled in 39 private boarding secondary schools in Uasin-Gishu County. The education system in Kenya is divided according to the socio-economic gradient, with the

affluent households more likely to send their children to private schools (“A Brief Profile on Inequality”, 2014). Private school attendance is used as a proxy measure of SES to identify students likely to be affected by the expanding formal fast food environment in Eldoret. In addition, the students in private schools are likely to have access to a wide range of extracurricular activities, especially in school, including sports; and sedentary activities such and watching Television. Data from the office of the District Education Officer (DEO) designated that there were 39 private boarding secondary schools in Uasin-Gishu County.

3.4.1 Inclusion Criteria

Participants were all boys and girls aged between 14 and 18 years. The sample was drawn from both single gender (boys or girls) and from mixed gender schools. Individual, church and community owned private boarding schools participated in the study too. Students who agreed to participate after getting consent from their teachers on behalf of their parents were included.

3.4.2 Exclusion Criteria

Students who did not provide consent and those with special needs were excluded from the study. Also exempted were students who were unable to participate in physical activity due to illness. They were excluded because the results could not accurately reflect their actual PA.

3.5 Sampling Technique

Sampling is the statistical method of choosing a sub-set called a sample of a population of interest to make observation and draw statistical inferences about the population.

Orodho (2003) defines a sample as a small subset of a larger population that is thought to be representative of the larger population. Any statements made about the sample should also apply to the entire population. As a result, data gathered from a smaller group or subset of the total population must be analysed in such a way that the knowledge gained is representative of the entire population under study.

A simple random sampling technique was applied to select participants for this study. All private boarding schools in Uasin-Gishu County were numbered in a continuous sequence from the first to the last. The Private Schools that took part in the study were then chosen at random using computer-generated random numbers. The Private School register was used to choose study participants at the school level. First, a list of all students enrolled in private schools was obtained. The students who took part in the research were then systematically selected using a table of random numbers.

The 196 student sample size was obtained using Neyman allocation formula as shown in table 3.6 below. The private schools were stratified into three categories as girls' schools, boys' schools and mixed Schools. In each private school, students were selected proportionately using simple random sampling technique according to the population of students in each private school as shown in **Table 3.1**.

Table 3. 1 Sample Size

Type of School	Number of students	Sample size
Girl's schools	281	59
Boy's schools	281	59
Mixed school	404	78
Total	936	196

3.6 Sample Size

A preliminary survey by the researcher indicated that there were 936 students who satisfied the criteria for inclusion in the study. The Fisher formula was used. (Fisher et al., 1983) cited in Mugenda & Mugenda, (2003) to determine the sample size of the respondents:

$$n = \frac{d^2 Z_{1-\sigma/2}^2 P(1-p)}{\quad} \quad \text{Where } Z_{1-\sigma/2} \text{ is the level of confidence (P<0.05)}$$

d is the absolute error or precision set at 5%

P is the expected prevalence proportion, expected proportion is 15%

$$\frac{1.96^2 \times 0.15(1 - 0.15)}{0.0025} = \frac{3.8416 \times 0.15(0.85)}{0.05^2} = 196$$

Source (Fisher *et al.*, 1983 in Mugenda, Mugenda 2003)

The sample size was distributed into strata according to Neyman allocation formula (1937) cited in Mugenda & Mugenda, (2003). The method's goal is to maximize survey precision given a fixed sample size. The best sample size for stratum denoted by h using Neyman allocation would be:

$$n_{h=} \left(\frac{N_h}{N} \right) n$$

Where,

h- The stratum

nh - The sample size for stratum h,

n - Total sample size,

Nh -The population size for stratum h,

N - The total population

Random sampling technique was used to select sampled students in each stratum as a result a sample size of 196 students was selected.

3.7 Research Instruments

Adolescent Physical Activity Questionnaire (PAQ-A) (Appendix I) was prepared for this study. The questionnaire was given to the participants who completed it and where necessary, the guidance of the researcher or the research assistants used. One questionnaire with three sections was used to gather information on PA. The sections comprised (i); the Socio-Demographic characteristics of the participants, and (ii) PAQ-A

and Diet Questionnaire. These questionnaires were validated by the supervisors of the study.

3.7.1 Section A: Socio-demographic Characteristics of the Participants

A self-administered questionnaire (Appendix I A.) was developed by the researcher to establish the gender and parental SES of the participants. Participants were asked to provide information on their parents' educational level, occupation and employment status. The parental SES was computed based on parents' education and occupation information as espoused by Doku et al., (2013).

3.7.2 Section B: Adolescents Physical Activity Questionnaire (PAQ- A)

Adolescents Physical Activity Questionnaire (PAQ- A) was used to collect data. The PAQ-A (Appendix I: A) was adopted for use in the study. PAQ-A is considered a valid and reliable measure of general PA levels from childhood to adolescence. The PAQ-A is a self-administered questionnaire that can be easily recalled after being filled. This makes it more appropriate in the determination of PA levels of the students throughout the academic period. Compared to other recall measures, the PAQ-A has comparatively robust correlation coefficients with other PA measures (Kowalski et al., 1997a; Kowalski et al., 1997b). The PAQ- A comprises nine Questions, each of which is scored on five-point Likert scale. The summation of PA was obtained from eight questions. An activity score between one and five is found for every question except question nine, which is time-based on a Likert-scale (Sobngwi et al, 2001).

The results of the mean of the eight questions obtained are shown in the final PAQ-A activity summary score. A score of 5 indicated high PA while a score of 1 indicated low PA. In the current study, the adopted questionnaire was used to collect data on

participants' recall of their level/frequency of involvement in rope skipping, walking for exercise, jogging, swimming, baseball, badminton, football, volleyball, field hockey over the previous seven days. PAQ-A indicated high content validity and acceptable item reliability (Bervoets et al., 2014).

3.7.3 Section C: Diet questionnaire

An adapted Food Frequency Questionnaire for adolescents (FFQ) was used to collect dietary data (Appendix I: C). The participants were asked to recall and record their dietary intake for the previous seven days. The food frequency questionnaire contains quantitative (food type) and qualitative (food portions) details of foods (Kolodziejczyk et al., 2012). Only the qualitative part with food type and the frequency of consumption was adapted for the study. The Socio-demographic characteristics which include age, gender and occupation and the food portions were omitted. The school menu substantiated the FFQ. The food types were carbohydrates, proteins, dairy, vegetables, fruits, sweets, sugar, spreads and beverages. Participants were asked to recall the frequency consumption of 7 food groups and beverages for the past one week. They selected the frequency of consumption of various foods in the FFQ. The scale ranged from daily, 2-3 times per week, 4-5 times per week, once weekly and never.

3.8 Pre-testing

Mugenda and Mugenda (2003) maintain that a sample size of a tenth of the calculated sample size with homogeneous characteristics should be selected for a pre-test. Pre-test data was collected through administration of questionnaires to eight boys and eight girls aged 14-18 years. The pre-test sample was obtained from the targeted schools from which

the sample for study was drawn and included only the participants who were exempted in the main study. Cronbach's Coefficient Alpha was computed to determine how items in the test correlate among themselves. The data capture tool was pre-tested before the actual administration to the sampled participants. Adopted PAQ-A pre-test for the study revealed high reliability. The Cronbach's Alpha reliability analysis results were ($\alpha=0.704$).

3.9 Validity and Reliability of Research Instruments

According to Baskar & Pragadeeswaran(2013) Validity is a quality associated with propositions or determining the level to which they conform to establish knowledge or truth. In this case, the researcher discussed items in the instruments. Their advice helped the researcher determine the validity of the research instruments. The input from supervisors included, suggestions, clarifications among other suggestions. The contributions helped in making the required adjustments. The pre-testing exercise was carried out in the targeted private secondary schools among students who were not included in the main study in Uasin-Gishu County. The pre-testing was done to test the reliability and content validity of the instruments and to ensure that it was adaptable to the local situation.

Reliability is the level an instrument produces the same results on replicated trials (Orodho, 2009). It is the level of consistency or whether it can be relied on to produce the same results when used in multiple attempts to measure theoretical concepts (Kothari, 2004). To ensure reliability of the research instruments, a pre-testing exercise was conducted in the targeted private boarding schools in Uasin-Gishu County. To obtain the

sample, the schools were stratified into three groups: girls' schools, boys' schools, and mixed schools, and a sample of eight boys and eight girls were chosen from the strata using simple random sampling. To test reliability, the split-half technique was used. The test was performed on the sample only once, and the results were divided into two equal parts then a correlation coefficient was computed after scoring each half of the pre-test items.

The pre-test sample was given a code that will be used to identify and exempt them from providing data for the study. Cronbach's Alpha coefficient was used to determine the reliability index. According to (Oluwatayo, 2012), a reliability index of 0.7 is considered ideal. The results of the study tests are presented in chapter Four. Reliability analysis was done with the use of Cronbach's Alpha which measures the internal consistency by establishing whether certain items within a scale measure the same construct. Lunneborg, (1979) cited in Mugenda and Mugenda (2003) recommended that instruments used in research should have reliability of 0.70 and above to form that study's benchmark. Cronbach's Alpha was established for every objective which formed a scale. Table 3.2 shows that diet had the highest reliability ($\alpha=0.867$), followed by parents' socio-economic status ($\alpha=0.746$) physical activity level though showed the lowest result, was still within the excellent category ($\alpha=0.704$). With all three variables showing an r of over 70, it can be safely assumed that the instrument was an excellent reliable evaluation tool. Table 3.2 presents the results.

Table 3. 2: Reliability Analysis

Dependent Variables	Cronbach's Alpha	Number of Items
Level of Physical Activity	0.704	30
Diet	0.867	42
Parent Socio-Economic Status	0.746	2

3.10 Data Collection Techniques

Three research assistants assisted with data collection. The research assistants were trained for one day. They were taken through the study and then thoroughly familiarised with the tools and how it was to be administered. After obtaining consent to carry out the research, the researcher and the research assistants travelled to each of the schools under study for familiarization and data collection planning purposes before the tools were administered. The objectives of the study and the role of the participants were explained. Participants who were willing to participate signed an informed consent form (Appendix VIII). Their teachers then signed their consent as guardians. This was done after approval by the Ministry of Education (MOE) Appendix (VII) and the respective head teachers of the sampled schools. During the second school visit, the researcher with the help of the research assistants administered the questionnaires to the participants. They were on available to clarify any items. After confirming that they were duly filled the completed questionnaires were collected on the same day.

3.11 Data Analysis and Presentation

Data was appraised, categorized into coherent thematic classifications based on the objectives then coded for analysis. Statistical Package for Social Sciences (SPSS) software version 22.0 was used to analyse the structured items. Descriptive statistics comprising means, standard deviations, frequencies and percentages were used to describe quantitative data. Data was presented using frequency tables and charts. Pearson's correlation analysis was used to determine the relationship between gender, diet, parent's social economic status and the level of engagement in physical activity. The significance level of 0.05 was used to test the hypotheses.

3.12 Logistical and Ethical Considerations

Authorization to conduct the study was granted by the Kenyatta University Graduate School (Appendix III). Ethical approval for the research was obtained from the Kenyatta University Ethics Committee (Appendix IV). A research permit was obtained from the National Council for Science and Technology (Appendix V). It was presented to the County Director of Education. The study was approved by the Ministry of Education (MOE) (Appendix VI). Each principal of the selected schools was requested for written permission to include their respective students in the study (Appendix VIII). Teachers were requested to sign the informed consent (Appendix VII) as guardians of the students.

The participants were briefed verbally and in writing (Appendices X Informed assent form) on the purpose of the study. The disclosure and privacy of the respondents was observed to safeguard their interests. Involvement in the study was voluntary and the data obtained was handled with confidentiality and anonymity. Participation in the study was

purely voluntary and participants had the freedom of either accepting or refusing to participate. Participants were also free to withdraw participation at any time of the study without any explanation and no consequences as a result (Appendix VII). The identity of each of the participants was kept confidential by use of dummy identification numbers in place of name in the data entry sheet. The student participants were not asked any sensitive questions. The research was carried out ethically with integrity, honesty, informed consent and respect for confidentiality. To ensure confidentiality, data will be saved and kept in a secure location.

CHAPTER FOUR: DATA ANALYSIS AND FINDINGS

4.1 Introduction

The data analysis and research findings are presented in this chapter. It includes response rate, demographic characteristics, data on frequency of physical activity participation, hypotheses testing and relationship between variables and PA.

4.2 Response Rate

All three Questionnaires were distributed to each of the one hundred and ninety six (196) identified sample participants for completion. Responses from one hundred and seventy-seven (177) participants constituted 90.31% response rate, a rate deemed excellent by Mugenda and Mugenda (2003). Almost all the questionnaires were completed following the instructions. There were only a few instances of missing data. This is presented in Table 4.1.

Table 4. 1 Response Rate

Questionnaires	Frequency	Percentage
Returned	177	90.31%
Non returned	19	9.69%
Total	196	100%

4.3 Demographic Characteristics of Participants

In collecting the demographic data of the participants, information about their gender, age and parental education level was sought in the questionnaires. Table 4.2 summarizes the demographic information of the participants. The participants provided their gender as shown in Table 4.2. As can be noted 51.4% of the participants were female while 48.6% were male. This indicates that both genders were well represented in the study.

The education status of the parents was represented by four responses as no education, primary education, technical education and university education. As indicated in Table 4.2, most participants' parents had university education (68.4%) followed by technical education (25.4%). Participants' parents with primary education and no education were 2.8% and 3.4% respectively. This implied that the parents with boys and girls aged between 14 and 18 years were reasonably educated. The respondents provided information on whether their parents were employed. Results show that 89.3% indicated that their parents were employed while only 10.7% indicated their parents were not employed. This implied that the parents with boys and girls aged between 14-18 years were employed. The respondents were further required to indicate the employment status of their parents by indicating whether they were employed fulltime, part time or casually. They responded as shown in Table 4.2. Results show that majority of the participants parents were employed fulltime (57.1%). A total of 33.9% of the participants parents were employed part-time while 9% were casually employed.

Table 4. 2 Demographic Information of the Participants

Gender	Frequency	Percent
Male	86	48.6
Female	91	51.4
Total	177	100

Parental SES		
Education Level	Frequency	Percent
No Education	6	3.4
Primary School	5	2.8
Technical College	45	25.4
University	121	68.4
Total	177	100

Formal Education	Frequency	Percent
Yes	158	89.3
No	19	10.7
Total	177	100

Employment Status	Frequency	Percent
Fulltime	101	57.1
Part-time	60	33.9
Casual	16	9
Total	177	100

4.4 Physical Activity Behaviours of the Participants

The study aimed at establishing the physical activities participants engaged in during their free time and the extent they were involved in the activities.

4.4.1 Physical Activity during Free Time

The respondents were asked to indicate the kinds of physical activity they engaged in during their free time.

Table 4. 3: Physical Activity during their Free Time

This table shows various physical activities and the frequency for the past 7 days.

Type of Physical Activity		7 times or more				
		0 times	1-2 times	3-4 times	5-6 times	more
Skipping	Freq	113	31	17	6	10
	%	63.8%	17.5%	9.6%	3.4%	5.6%
Walking for Exercise	Freq	55%	34%	27%	12%	49%
	%	31.1	19.2	15.3	6.8	27.7
Jogging	Freq	57%	41%	25%	22%	32%
	%	32.2	23.2	14.1	12.4	18.1
Swimming	Freq	150	6	11	8	2
	%	84.7%	3.4%	6.2%	4.5%	1.1%
Baseball	Freq	139	17	11	3	7
	%	78.5%	9.6%	6.2%	1.7%	4%
Dance	Freq	69	36	26	16	30
	%	39%	20.3%	14.7%	9%	16.9%
Badminton	Freq	123	19	15	10	10
	%	69.5%	10.7%	8.5%	5.6%	5.6%
Football	Freq	64	38	30	20	25
	%	36.2%	21.5%	16.9%	11.3%	14.1%
Volleyball	Freq	101	27	18	17	14
	%	57.1%	15.3%	10.2%	9.6%	7.9%
Field hockey	Freq	121	25	9	9	13

%	68.4%	14.1%	5.1%	5.1%	7.3%
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The results from Table 4.3 revealed that, 5.6% (10) of the students had skipped 7 times or more, 3.4% (6) 5 to 6 times, 9.6% (17) had skipped 3 to 4 times, 17.5% (31) 1 to 2 times while 63.8% (113) had not skipped in the past 7 days. Thus suggesting that skipping was not a common form of exercise among students in private boarding schools in Uasin-Gishu County.

The study further revealed that 27.7% (49) of the participants walked for exercise 7 times or more, 6.8% (12) 5 to 6 times, 15.3% (27) 3 to 4 times, 19.2% (34) 1 to 2 times whereas 31.1% (55) did not walk for exercise. Compared to skipping, more students walked for exercise during their free time.

Additionally, 18.1% (32) of the participants noted that they jog 7 times or more per week, 12.4% (22) jogged 5 to 6 times in the last week, 14.1% (25) 3 to 4 times, 23.2% (41) had jogged 1 to 2 times. However, 32.2% (57) had not jogged in the past 7 days during their free time.

The results revealed that 1.1% (2) of the students had swum 7 times or more, 4.5% (8) 5 to 6 times, 6.2% (11) 3 to 4 times, 3.4% (6) 1 to 2 times while 84.7% (150) had not swum in the past 7 days during their free time. The results imply that majority 84.7% (150) of the students had not swum during their free time.

With regard to baseball, 4% percent (7) of the students played baseball 7 times or more during their free time, 1.7% (3) 5 to 6 times, 6.2% (11) 3 to 4 times, 9.6% (17) 1 to 2

times while 78.5% (139) did not play baseball in the past 7 days during their free time. The implication is that a few of the students play baseball during their free time.

Results showed that, 16.9% (30) of the students had danced 7 times or more during their free time, 9% (16) 5 to 6 times, 14.7% (26) 3 to 4 times, 20.3% (36) 1 to 2 times while 39% (69) had not danced in the past 7 days during their free time. Generally, dancing was a common form of exercise among students in private boarding schools in Uasin-Gishu County.

Results revealed that, 5.6% (10) of the students played badminton 7 times or more, 5.6% (10) 5 to 6 times, 8.5% (15) 3 to 4 times, 10.7% (19) 1 to 2 times whereas 69.5% (123) did not play badminton in the past 7 days during their free time. Overall, few of the students played badminton in the past 7 days during their free time.

Moreover, Fourteen percent (25) of the students had played football 7 times or more in the past 7 days, 11.3% (20) 5 to 6 times, 16.9% (30) 3 to 4 times, 21.5% (38) 1 to 2 times while 36.2% (64) had not played football in the past 7 days during their free time.

7.9% (14) of the participants had played volleyball 7 times or more, 9.6% (17) 5 to 6 times, 10.2% (18) 3 to 4 times, 15.3% (27) 1 to 2 times whereas 57.1% (101) had not played volleyball in the past 7 days during their free time.

Finally results revealed that, 7.3% (13) of the students had played hockey 7 times or more, 5.1% (9) 5 to 6 times, 5.1% (9) 3 to 4 times, 14.1% (25) 1 to 2 times while 68.4% (121) had not played field hockey in the past 7 days during their free time.

4.4.2 Frequency of Physical Activity during Physical Education Lessons

The study aimed to establish how often the students played, jumped and threw during physical education lessons. Chart 4.1 highlights the results.

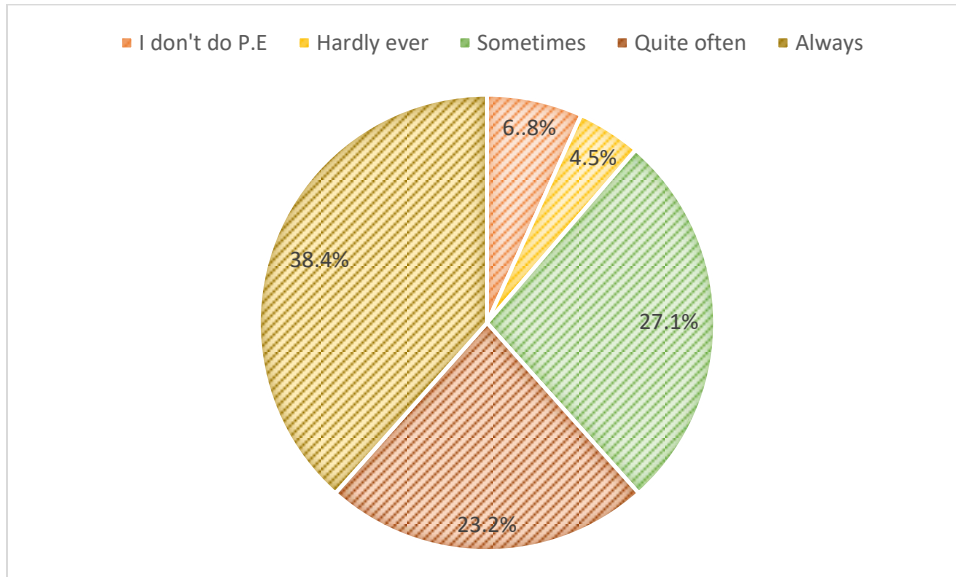


Chart 4. 1: Frequency of Play during Physical Education

As shown in Pie chart 4.1, hardly 4.5% (8) of the participants engaged in VPA jumped or threw during physical education, 6.8% (12) did not do P.E, 23.2% (41) quite often played, jumped or threw during physical education, 27.1% (48) sometimes engaged in physical activity during physical education, while 38.4% (68) always played hard, jumped or threw during physical education in the past 7 days. Playing hard, jumping or throwing during physical education probably accounted for the 38.4% of the students meeting the recommended moderate physical activity levels..

4.4.3 Activities Done During Free Time

The participants were asked to indicate the activities they engaged in during their free time. Chart 4.2 illustrates what the participants did in the last 7 days during their free time.

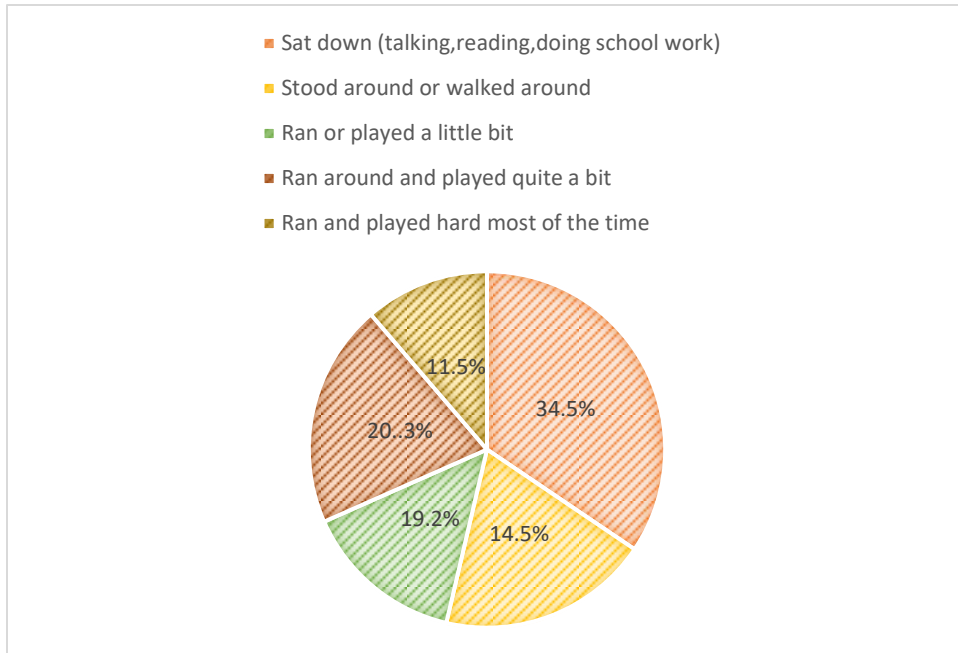


Chart 4. 2: Activities Done During Free Time

Findings in chart 4.2 revealed that, 11.5% (20) of the students ran and played most of the time during free time, 14.7% (26) ran or did some exercise, 19.2% (34) stood or walked, 20.3% (36) ran and played quite a bit and 34.5% (61) sat down (talking, reading and doing schoolwork).

4.4.4 Activities during Lunch

The study deemed it necessary to establish what the students did during lunch time. Chart 4.3 highlights the results.

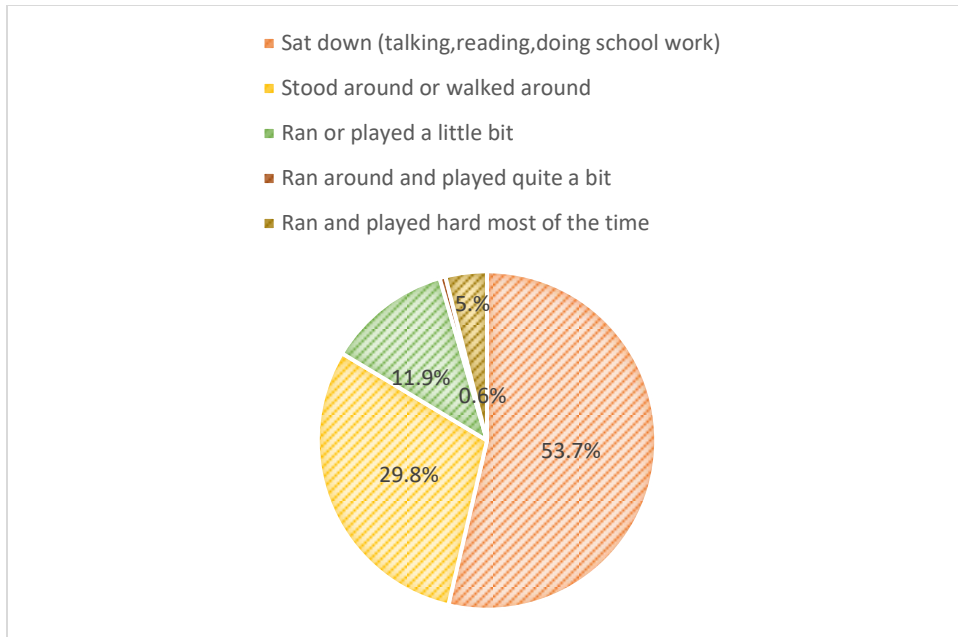


Chart 4. 3: Activities during Lunch

From the results, 0.6% (1) of the student ran around and played quite a bit, 4% (7) ran and played hard most of the time, 11.9% (21) ran or played a little bit, 29.9% (53) stood around or walked around and 53.7% (95) of them sat down (talking, reading and doing school work).

4.4.5 Frequency of Activities after School

The study sought to establish what the students did in the last 7 days right after school.

Findings on activities done in the past week are illustrated in chart 4.4.

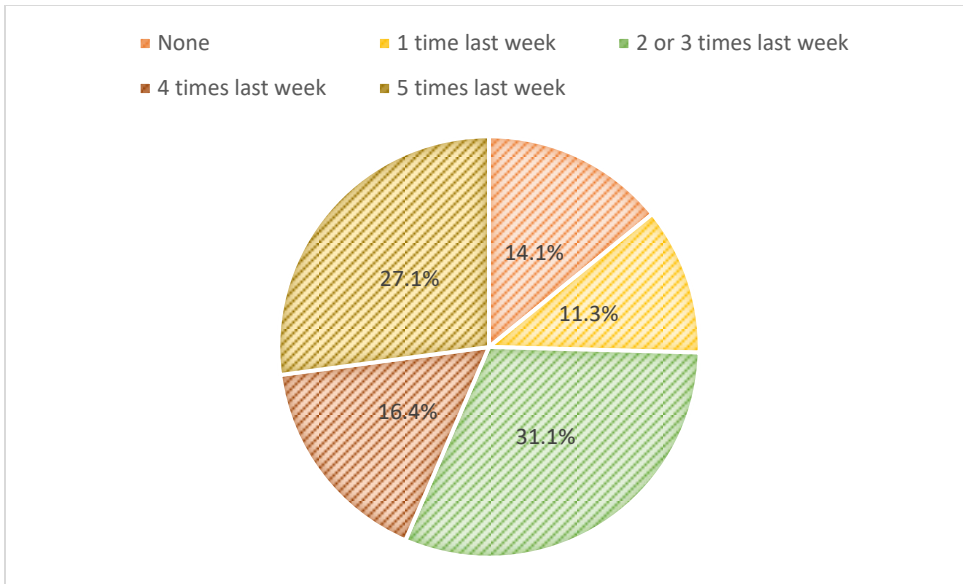


Chart 4. 4: Frequency of Activities after School

Results in chart 4.4 show that, 11.3% (20) of the respondents participated in sports, dance or played games at least once after school, 14.1% (25) did not participate in sport or dance nor play any games, 16.4% (29) participated in these activities i 4 times the previous week, 27.1% (48) participated in sports, dance or games 5 times last week and while 31.1% (55) participated in them 2 or 3 times last week.

4.4.6 Frequency of Activities in the Evenings

Chart 4.5 presents the results on how many evenings the respondents did sports, danced or played games in the past 7 days.

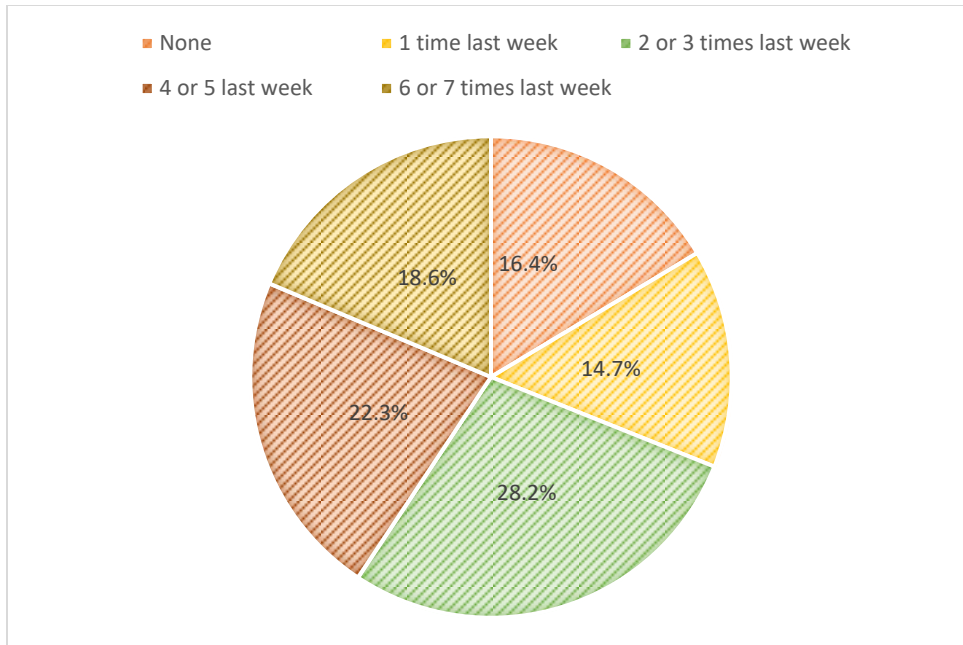


Chart 4. 5: Frequency of Activities in the Evenings

Results from the chart indicate that 14.7% (26) of the participants did sports, dance or played games at least once last week, 16.4% (29) did not participate in sports, dance or games, 18.6% (33) participated in sports, dance or played games 6 or 7 times last week, 22% (39) 4 or 5 times last week while 28.2% (50) 2 or 3 times last week.

4.4.7 Frequency of Activities in the Weekend

The study enquired from the participants the number of times they did sports, dance or play games on the last weekend. Chart 4.6 illustrates the results.

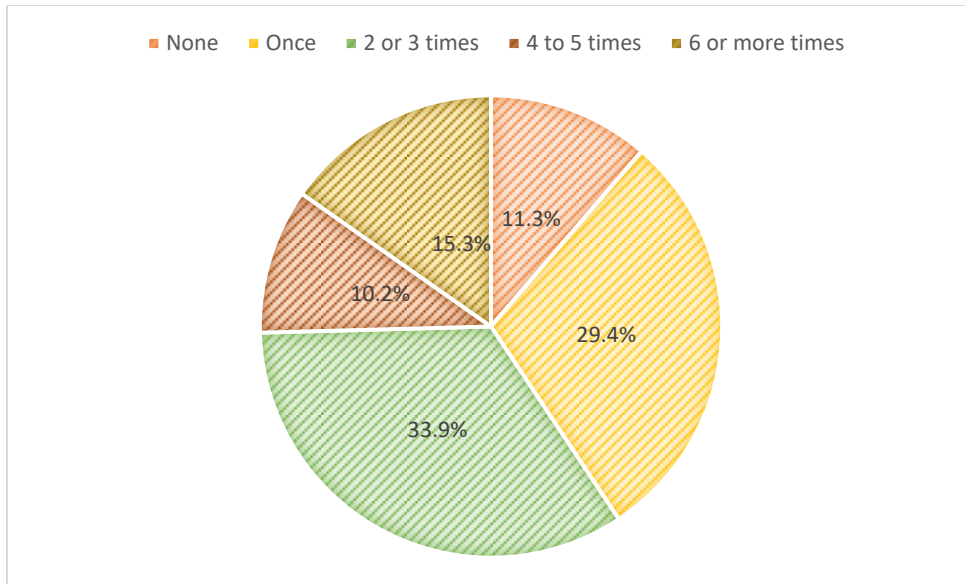


Chart 4. 6: Frequency of Activities in the Weekend

Based on the findings, 10.2% (18) of the students engaged in sports, dance or games 4 to 5 times, 11.3% (20) did not engage in sports, dance or games, 15.3% (27) participated 6 or more times per week, 29.4% (52) participated just once and 33.9% (60) participated 2 or 3 times per week.

4.4.8 Best Description of the Students' Activities in the Past 7 Days

This section presents the results on the best description of the students' activities in the past 7 days. The results are presented in Table 4.4. The study enquired from the students whether all or most of their free time was spent in activities that involve little effort.

Table 4. 4: Best Description of the Students' Activities in the Past 7 Days

Activities in one Week		Yes	No	Total
All or most of my free time was spent doing activity that involve little effort	Freq	51	126	177
	%	29%	71%	100%
I sometimes (1 to 2 times last week) did physical activity in my free time (e.g. played sports, went running, swimming, bike riding, did aerobics)	Freq	38	139	177
	%	22%	78%	100%
I often (3 to 4 times last week) did physical activity in my free time	Freq	50	127	177
	%	28%	72%	100%
I quite often (5 to 6 times last week) did physical activity in my free time	Freq	15	162	177
	%	8%	92%	100%
I very often (7 or more times last week) did physical activity in my free time	Freq	22	155	177
	%	12%	88%	100%

The results revealed that 29% (51) of the students were physically active while 71% (126) of them were not active. The implication is that majority of the students spent their free time being sedentary.

When asked if they engage in physical activity (1 to 2 times) such as playing sports, running, swimming, biking, or aerobics in their free time, only 22% (38) of the total participants said they did.

Furthermore, 28% (50) of the students participated in physical activity often (3 to 4 times last week) during their free time. Also noted was that, 8% (15) of the students indulged quite often (5 to 6 times last week) in physical activity during their free time. Finally, 12% (22) of the students were very often (7 or more times last week) involved in physical activity during their free time.

4.4.9 Frequency of Engaging in Physical Activity

This section presents results on the frequency of engaging in physical activity. The results are presented in Table 4.13.

Table 4. 5: Frequency of Engaging in Physical Activity

Physical activities done in one week are presented in Table 4.5.

How often do you engage in PA		Frequency					Mean	Std. Dev
		None	Little bit	Medium	Often	Very often		
Monday	Freq	41	53	34	34	15	2.6	1.267
	%	23%	30%	19%	19%	8.5%		
Tuesday	Freq	48	47	36	29	17	2.55	1.305
	%	27.4%	27%	20%	16%	9.6%		
Wednesday	Freq	41	42	47	34	13	2.64	1.236
	%	23%	24%	27%	19%	7.3%		
Thursday	Freq	45	39	26	39	28	2.81	1.437
	%	25%	22%	15%	22%	16%		
Friday	Freq	51	40	31	30	25	2.65	1.415
	%	29%	23%	18%	17%	14%		

Saturday	Freq	39	18	19	47	54	3.33	1.54
	%	22%	10%	11%	27%	31%		
Sunday	Freq	39	24	19	47	48	3.23	1.525
	%	22%	14%	11%	27%	27%		

The results revealed that 8.5% (15) of the students played sports, games or danced very often, 19% (34) participated often, 19% (34) revealed medium participation, 30% (53) a little bit and 23% (41) did not play sports, games or dance on Mondays. The mean value of 2.6 confirmed that students in private boarding schools rarely participated in physical activity on Mondays.

A total of 9.6% (17) participated very often in sports, games or dance on Tuesdays, 16% (29) often played sports, games or dance on a Tuesday, 20% (36) reflected medium participation, 27% (47) a little bit of participation and 27.4%(48) did not play sports, games or dance on a Tuesday. The item realized a mean of 2.55 implying that the students hardly participated in sports, games or dance on Tuesdays.

With regard to participation on Wednesdays, 7.3% (13) of the students were participated very often t in sports, games or dance , 19% (34) were often involved in sports, games or dance, 27% (47) showed medium participation, 24% (42) involved in a little bit of participation in sports, games and dance and 23% (41) did not engage in sports, games or dance. The results were backed by a mean of 2.61 and standard deviation of 1.236. Thursdays revealed that 16% (28) of the students very often played sports, games or dance, 22% (39) often, 15% (26) showed medium participation 22% (39) a little bit and

25% (45) did not play sports, games or dance. The results were supported by a mean of 2.81 and a standard deviation of 1.437.

With regard to Fridays, 14% (25) of the students very often played sports, games or dance, 17% (30) often, 18% (31) showed medium participation, 23% (40) a little bit of participation whereas 29% (51) of them did not engage in sports, games or dance. The standard deviation of 1.415 and a mean of 2.65 were observed.

The results further revealed that 31% (54) of the participants very often engaged in sports, games or dance on Saturdays, 27% (47) often, 11% (19) medium, 10% (18) a little bit but 22% (39) did not engage in sports, games or dance. Compared to the weekdays, more students engage in physical activity during the weekend possibly due to more free time. The results are supported by a mean of 3.33 and a standard deviation of 1.54.

Finally, 27% (48) of the students very often engaged in sports, games or dance on Sundays, 11% showed medium participation, 14% (24) a little bit whereas 22% (39) of the students did not engage in sports, dance or games on Sundays. Notably, more students engaged in physical activities on a Sunday compared to the weekdays. The results are backed up by a mean of 3.23 and a standard deviation of 1.525.

4.5 Gender and Physical Activity of the Participants

This section presents results concerning gender and physical activity. Of the 196 participants 51.4 % were girls and 48.6% were boys.

4.5.1 Mean differences across Gender with Participation in Physical Activity

An independent sample test was computed using Levine's test for equality to determine whether there was any significant difference in PA participation between the two groups.

., Results in Table 4.6 (b) show a significant difference between male and female, $t(175) = 2.754$, $p = .007$. That is, the average participation score of females ($F = 2.26$, $SD = .484$) was significantly different from that of males ($M = 2.46$, $SD = .459$), Table 4.6 (a).

Table 4. 6(a): T-Test for Gender on Participation in Physical Activities

Variable	Gender	N	Mean score	Std. dev
Participation in Physical	Male	86	2.46	.459
	Female	91	2.26	.484
Total		177		

Table 16 (b) Independent Samples Test

Levene's test for Equality of variances					
PA	F	p-v	t	df	p-v
Equal variances assumed	.409	.523	2.754	175	.007
Equal variances not assumed			2.758	174.99	.006

The first column shows the actual difference between the two means (0.07) which is the numerator of the t-test formula. The second column presents the standard deviation of the difference scores (0.79). The third column shows the standard error of the mean (0.06), which is the denominator of the t-test formula. The 95% Confidence Interval presents the lower and upper limits of the mean difference (that is, it can be 95% confident that the difference between the means falls somewhere between -0.052 and 0.183). The most important columns for our purposes are the one presenting the obtained t-value (1.105) and its probability, or insignificance (0.271). These results suggest that girls participate less in physical activity than boys.

4.6 Dietary Habits of the Participants

This section presents the frequency of consumption of different types of food in the previous seven days. The participants indicated the kinds of foods they consumed over the previous seven (7) days.

4.6.1 Frequency of Consumption of Carbohydrates

Carbohydrates are the body's primary energy source. The study specifically sought to establish the number of times the students consumed carbohydrates in the last one week.

The number of times the participants consumed carbohydrates in the last one week is presented in Table 4.7.

Table 4. 7: Carbohydrates Consumed for 7 Days

Type of Food		Never	Once	2 times	3 times	4 times	5 times
Ugali whole or sifted	Freq	10	7	14	11	8	127
	%	5.6%	4%	7.9%	6.2%	4.5%	71.8%
White bread	Freq	23	15	9	10	11	109
	%	13%	8.5%	5.1%	5.6%	6.2%	61.6%
Brown bread	Freq	93	17	22	15	5	25
	%	52.5%	9.6%	12.4%	8.5%	2.8%	14.1%
White rice	Freq	24	11	46	48	16	32
	%	13.6%	6.2%	26%	27.1%	9%	18.1%
Brown rice	Freq	129	24	9	8	4	3
	%	72.9%	13.6%	5.1%	4.5%	2.3%	1.7%
Whole meal chapati	Freq	114	38	9	8	6	2
	%	64.4%	21.5%	5.1%	4.5%	3.4%	1.1%
Sifted flour chapati	Freq	122	22	6	7	5	15
	%	68.9%	12.4%	3.4%	4%	2.8%	8.5%
Githeri	Freq	13	5	10	39	28	82
	%	7.3%	2.8%	5.6%	22%	15.8%	46.3%
Mandazi	Freq	104	24	16	16	6	11
	%	58.8%	13.6%	9%	9%	3.4%	6.2%
French fries	Freq	125	31	3	5	7	6
	%	70.6%	17.5%	1.7%	2.8%	4%	3.4%

As shown in Table 4.6, 71.8% (127) participants consumed ugali five times, 4.5% (8) four times, 6.2% (11) three times, 7.9% (14) two times, 4% (7) once while 5.6% (10) of the students had not consumed ugali whole or sifted in the last seven days. Generally, ugali whole or sifted is a common meal for students in private boarding schools as indicated in the frequency of consumption.

The results showed that 61.6% (109) consumed white bread five times, 6.2% (11) four times, 5.6% (10) three times, 5.1% (9) twice, 8.5% (15) once and 13% (23) of the students never consumed white bread in the last seven days. Majority of the students had consumed white bread in the last 7 days.

Further, 14.1% (25) of the students consumed brown bread five times in the last 7 days, 2.8% (5) four times, 8.5% (15) three times, 12.4% (22) twice, 9.6% (17) once while 52.5% (93) did not consume brown bread. Overall, students consuming brown bread were relatively fewer compared to those consuming white bread.

The results from the study indicated that 18.1% (32) of the participants consumed white rice five times in the last 7 days, 9% (16) four times, 27.1% (48) three times, 26% (46) twice, 6.2% (11) once and 13.6% (24) did not consume white rice at all.

Furthermore, 1.7% (3) of the students consumed brown rice five times in the last seven days, 2.3% (4) four times, 4.5% (8) three times, 5.1% (9) twice, 13.6% (24) once, while 72.9% (129) of the students did not consume brown rice in the last 7 days. Compared to consumption of white rice, fewer students consumed brown rice in the past 7 days.

Additionally, 1.1% (2) of the participants consumed chapati five times in the last one week, 3.4% (6) four times, 4.5% (8) three times, 5.1% (9) twice, 21.5% (38) once while 64.4% (114) of the respondents did not consume whole meal chapati in the last 7 days. The implication is that whole meal chapati is not a common meal in private boarding schools in Uasin-Gishu County.

Similarly, 8.5% (15) of the students consumed sifted flour chapati five times in the last 7 days, 2.8% (5) four times, 4% (7) three times, 3.4% (6) twice, 12.4% (22) once while 68.9% (122) had not consumed sifted flour chapati in the last 7 days. The results suggest that sifted flour chapati was not a frequent meal for students in private boarding schools in Uasin-Gishu County.

The results indicated that 46.3% (82) of the students consumed Githeri five times in the last 7 days, 15.8% (28) of them consumed it four times, 22% (39) three times, 5.6% (10) twice, 2.8% (5) once and 7.3% (13) did not consume Githeri in the past 7 days. The findings imply that Githeri is often consumed in the private boarding schools in Uasin-Gishu County.

A total of 6.2% (11) of the students consumed Mandazi five times, 3.4% (6) four times, 9% (16) three times, 9% (16) twice, 13.6% (24) once while 58.8% (104) of the students had not consumed Mandazi in the past 7 days.

Finally, 3.4% (6) of the students consumed French fries five times in the past 7 days, 4% (7) four times in the past 7 days, 2.8% (5) three times in the last 7 days, 1.7% (3) twice, and 17.5% (31) once while 70.6% (125) of the students had not consumed French fries in

the last 7 days. The implication is that French fries were not a common meal in private boarding schools in Uasin- Gishu County.

4.6.2 Frequency of Consumption of Dairy Foods

Dairy products are rich in vitamins and minerals essential for good bone health. The study sought to determine the number of times the students consumed dairy foods in the last one week. Table 4.4 shows the results.

Table 4. 8: Dairy Foods Consumed by the Participants

This table presents the frequency consumption of dairy foods for a period of one week.

Dairy Food Source/ Type		Never	Once	2 times	3 times	4 times	5 times
Dairy food	Freq	109	16	17	13	3	19
	%	61.6	9	9.6	7.3	1.7	10.7
Whole fat milk	Freq	126	14	16	10	4	7
	%	71.2	7.9	9	5.6	2.3	4
Low fat milk	Freq	114	21	14	8	9	11
	%	64.4	11.9	7.9	4.5	5.1	6.2
Skimmed milk	Freq	126	15	10	13	4	9
	%	71.2	8.5	5.6	7.3	2.3	5.1
Fermented milk/mala	Freq	140	17	5	4	3	8
	%	79.1	9.6	2.8	2.3	1.7	4.5

The results indicated that 4% (7) of the participants consumed whole fat milk five times in the last 7 days, 2.3% (4) four times, 5.6% (10) three times, 9% (16) twice, 7.9% (14) once though 71.2% (126) of them had not consumed whole fat milk in the past 7 days. The results suggests that whole fat milk is rarely consumed in private boarding schools in Uasin-Gishu County.

The results revealed that 6.2% (11) of the participants consumed low fat milk five times in the last 7 days, 5.1% (9) four times, 4.5% (8) three times, 7.9% (14) twice, 11.9% (21) once while 64.4% (114) of them had not consumed low fat milk in the last 7 days.

Similarly, 5.1% (9) of the students consumed skimmed milk five times in the last 7 days, 2.3% (4) four times, 7.3% (13) three times, 5.6% (10) twice, 8.5% (15) once whereas 71.2% (126) of the students had not consumed skimmed milk in the last 7 days. Moreover, 4.5% (8) of the students consumed fermented milk five times in the last 7 days, 1.7% (3) four times, 2.3% (4) three times, 2.8% (5) twice, 9.6% (17) once and 79.1% (140) had not consumed fermented milk in the last 7 days.

4.6.3 Frequency of Consumption of Protein, Meat & Meat products

Protein is an important macronutrient that is key to tissue production and development of the body. The study therefore found it crucial to establish the number of times the participants consumed protein, meat and meat products in the past 7 days. Table 4.5 illustrates the results.

Table 4. 9: Protein, Meat & Meat Products Consumed in One Week

The frequency of consumption of proteins, meat and meat products is presented in **Table**

4.5

Source of Proteins		Never	Once	2 times	3 times	4 times	5 times
Beef	Freq	27	41	68	29	1	11
	%	15.3%	23.2%	38.4%	16.4%	0.6%	6.2%
Chicken	Freq	103	43	6	9	5	11
	%	58.2%	24.3%	3.4%	5.1%	2.8%	6.2%
Fish	Freq	137	16	5	2	7	10
	%	77.4%	9	2.8%	1.1%	4%	5.6%
Sausage	Freq	134	12	11	7	4	9
	%	75.7%	6.8%	6.2%	4%	2.3%	5.1%
Eggs	Freq	118	30	10	8	8	3
	%	66.7%	16.9%	5.6%	4.5%	4.5%	1.7%

As shown in the Table,6.2% (11) of the participants consumed beef five times in the last 7 days, 0.6% (1) four times, 16.4% (29) three times, 38.4% (68) twice, 23.2% (41) once and 15.3% (27) of the participants had not consumed meat in the last 7 days. On average, the students consumed meat mostly twice in the last 7 days.

The results revealed that 6.2% (11) of the participants consumed chicken 5 times in the past 7 days, 2.8% (5) four times, 5.1% (9) three times, 3.4% (6) twice, 24.3% (43) once while 58.2% (103) did not consume chicken. Consequently, chicken was rarely consumed in private boarding schools in Uasin-Gishu.

The results were such that 5.6% (10) of the students consumed fish five times in the last 7 days, 4% (7) four times, 1.1% (2) three times, 2.8% (5) twice, 9% (16) once while 77.4% (137) of them did not consume fish. The implication is that students in private boarding schools rarely consumed fish.

Furthermore, 5.1% (9) of the students consumed sausage bacon/meat smokies five times in the last 7 days, 2.3% (4) four times, 4% (7) three times, 6.2% (11) twice, 6.8% (12) once whereas 75.7% (134) of the students never consumed sausage bacon/meat smokies in the last 7 days. Just like fish, sausages were seldom consumed by students in private boarding schools.

Finally, 1.7% (3) of the students consumed eggs five times in a week, 4.5% (8) of the students consumed eggs four times in a week, 4.5% (8) three times, 5.6% (10) twice, 16.9% (30) once while 66.7% (118) of the students had not consumed eggs in the past 7 days. The implication is that eggs are rarely consumed by students in private boarding schools in Uasin-Gishu County.

4.4.4 Consumption Patterns of Legumes/Pulses and Nuts

Legumes and nuts are valuable sources of proteins, essential amino acids, fibre and carbohydrates. Legumes are cheap and readily available. The study deemed it necessary to establish the number of times the students have consumed legumes/pulse and nuts in the last one week. Table 4.6 shows the results.

Table 4. 10: Legumes/Pulse and Nuts Consumed for 7 Days

The source of legumes and nuts consumed by the participants in a period of one week is presented in Table 4.6.

Source of Food		Never	Once	2 times	3 times	4 times	5 times
Dry beans	Freq	54	13	27	24	15	44
	%	30.5%	7.3%	15.3%	13.6%	8.5%	24.9%
Green grams	Freq	132	15	8	4	10	8
	%	74.6%	8.5%	4.5%	2.3%	5.6%	4.5%
Groundnuts	Freq	103	15	15	17	6	21
	%	58.2%	8.5%	8.5%	9.6%	3.4%	11.9%
Dry peas	Freq	133	8	13	10	5	8
	%	75.1%	4.5%	7.3%	5.6%	2.8%	4.5%

The results indicated that 24.9% (44) of the participants consumed dry beans 5 times in the past 7 days, 8.5% (15) four times, 13.6% (24) three times, 15.3% (27) twice, 7.3% (13) once while 30.5% (54) of the students never consumed dry beans in the last 7 days. The results suggest that the students in private boarding schools frequently consume dry beans which are energy dense food.

Concerning green grams, 4.5% (8) of the students consumed green grams five times in the past 7 days, 5.6% (10) four times, 2.3% (4) three times, 4.5% (8) twice, 8.5% (15) once while 74.6% (132) had not consumed green grams in the past 7 days. Thus, there is lower consumption of green grams as compared to dry beans.

In addition, 11.9% (21) of the students consumed groundnuts five times, 3.4% (6) four times, 9.6% (17) three times, 8.5% (15) twice, 8.5% (15) once, while 58.2% (103) of the students had not consumed groundnuts in the last seven days.

Finally, the study established that 4.5% (8) of the students consumed dry peas five times in the last 7 days, 2.8% (5) four times, 5.6% (10) three times, 7.3% (13) twice, 4.5% (8)

once while 75.1% (133) of the students had not consumed dry peas in the last 7 days. Consequently, dry peas were least consumed in private boarding schools in Uasin-Gishu County.

4.6.5 Frequency of Consumption of Vegetables

The study sought to establish the number of times the students consumed vegetables in the last 7 days. Table 4.7 illustrates the results of vegetables taken by the participants.

Table 4. 11: Types of Vegetables Consumed for One Week

Information on the frequency of consumption of vegetables is presented in Table 4.7

Types of Vegetables		Never	Once	2 times	3 times	4 times	5 times
Kale	Freq	24	6	10	18	15	104
	%	13.6	3.4	5.6	10.2	8.5	58.8
Cabbage	Freq	52	18	19	14	17	57
	%	29.4	10.2	10.7	7.9	9.6	32.2
African leafy vegetables	Freq	120	11	9	12	11	14
	%	67.8	6.2	5.1	6.8	6.2	7.9

The results indicated that 58.8% (104) of the participants consumed kale five times in the last 7 days, 8.5% (15) four times, 10.2% (18) three times, 5.6% (10) twice, 3.4% (6) once though 13.6% (24) of them had not consumed kale in the past 7 days. The results suggest that kale is frequently consumed in private boarding schools in Uasin-Gishu County.

The results further revealed that 32.2% (57) of the participants consumed cabbage five times in the last 7 days, 9.6% (17) four times, 7.9% (14) three times, 10.7% (19) twice, 10.2% (18) once while 67.8% (120) of them had not consumed cabbage in the last 7 days.

Finally, 7.9% (14) of the students consumed African leafy vegetable five times in the last 7 days, 6.2% (11) four times, 6.8% (12) three times, 5.1% (9) twice, 6.2% (11) once

whereas 67.8% (120) of the students had not consumed African leafy vegetables in the last 7 days. Compared to the consumption of Kale and Cabbage, relatively fewer students consumed other African leafy vegetables.

4.6.6 Frequency of Consumption of Fruits

Fruits are an essential supply of micronutrients such as vitamins, minerals and certain simple sugars that are crucial in some amounts for physiological processes of individuals.

Table 4. 12: Types of Fruits Consumed in the Past 7 Days.

The study sought to establish the number of times the students consumed fruits in the last 7 days. Table 4.8 highlights various types of fruits and the frequency of consumption for a period of one week.

Varieties of Fruits		Never	Once	2 times	3 times	4 times	5 times
Bananas	Freq	102	26	16	13	7	13
	%	57.6%	14.7%	9%	7.3%	4%	7.3%
Avocado	Freq	58	17	14	40	24	24
	%	32.8%	9.6%	7.9%	22.6%	13.6%	13.6%
Passion	Freq	112	15	25	9	8	8
	%	63.3%	8.5%	14.1%	5.1%	4.5%	4.5%
Orange	Freq	52	56	26	11	21	11
	%	29.4%	31.6%	14.7%	6.2%	11.9%	6.2%
Pineapple	Freq	128	17	8	8	5	11
	%	72.3%	9.6%	4.5%	4.5%	2.8%	6.2%

From Table 4.8, 7.3% (13) of the students consumed bananas 5 times in the past 7 days, 4% (7) four times, 7.3% (13) three times, 9% (16) twice, 14.7% (26) once while 57.6% (102) did not consume bananas. Overall, majority of the students did not consume bananas.

With reference to the consumption of avocados, 13.6% (24) of the students consumed Avocado five times in the past 7 days, 13.6% (24) four times, 22.6% (40) three times, 7.9% (14) twice, 9.6% (17) once while 32.8% (58) did not consume avocados. Compared to bananas, more students in private boarding schools consumed Avocados.

Regarding the number of times the students consumed passion fruits in the past 7 days, 4.5% (8) of the students consumed passion fruits five times, 4.5% (8) four times, 5.1% (9) three times, 14.1% (25) twice, 8.5% (15) once while 63.3% (112) of the students had not consumed passion fruits in the past 7 days.

Moreover, the students were asked whether they had consumed oranges in the last seven days. The results showed that 6.2% (11) of the students had consumed oranges five times in last seven days, 11.9% (21) four times, 6.2% (11) three times, 14.7% (26) twice, 31.6% (56) once yet 29.4% (52) of the students had not consumed oranges in the last seven days.

Finally, 6.2% (11) of the students noted that they had consumed pineapple five times in the last 7 days, 2.8% (5) four times, 4.5% (8) three times, 4.5% (8) twice, 9.6% (17) once and 72.3% of them had not consumed pineapples in the last seven days. Generally, there is low consumption of fruits by the students in private boarding schools in Uasin-Gishu County. It could be because of meal skipping or accessibility to sugary fruit drinks.

4.6.7 Frequency of Consumption of Spreads and Beverages

A variety of nutrients, including amino acids, lipids, and vitamins, can be found in beverages. Spreads supply the body with fatty acids that it cannot synthesize and aid in the absorption of fat-soluble vitamins. The study sought to find out the number of times

the students have consumed spreads and beverages in the last one week. Table 4.9 illustrates the results.

Table 4. 13: Spreads and Beverages Consumed in the Past 7 Days

Table 4.9 shows the soft drinks and beverages taken by the participants in the past seven days.

Types of Spreads and Beverages		Never	Once	2 times	3 times	4 times	5 times
Juice	Freq	92	41	12	7	13	12
	%	52	23.2	6.8	4	7.3	6.8
Soda	Freq	85	23	33	19	6	11
	%	48	13	18.6	10.7	3.4	6.2
Peanut butter	Freq	95	25	13	17	6	21
	%	53.7	14.1	7.3	9.6	3.4	11.9
Margarine	Freq	89	25	28	8	18	9
	%	50.3	14.1	15.8	4.5	10.2	5.1
Jam	Freq	95	23	8	12	12	27
	%	53.7	13	4.5	6.8	6.8	15.3

With regard to juice, 6.8% (12) participants had drunk juice five times, 7.3% (13) four times, 4% (7) three times, 6.8% (12) two times, 23.2% (41) once while 52% (92) of the students had not drunk juice in the last seven days. Majority (52%) of the students had not drunk juice possibly because some of the private schools did not allow students to bring juice to school.

The results showed that 6.2% (11) drunk soda five times, 3.4% (6) four times, 10.7% (19) three times, 18.6% (33) twice, 13% (23) once whereas 48% (85) of the students did not drink soda in the last seven days. Soda was rarely consumed by the students in private boarding schools.

Moreover, results indicated that 11.9% (21) of the students consumed peanut butter five times in the last 7 days, 3.4% (6) four times, 9.6% (17) three times, 7.3% (13) twice, 14.1% (25) once while 53.7% (95) did not consume peanut butter.

The results from the study indicated that 5.1% (9) of the participants consumed margarine five times in the last 7 days, 10.2% (18) four times, 4.5% (8) three times, 15.8% (28) twice, 14.1% (25) once, while 50.3% (89) did not consume margarine at all.

The results further revealed that 15.3% (27) of the students had consumed jam five times in last seven days, 6.8% (12) four times, 6.8% (12) three times, 4.5% (8) twice, 13% (23) once yet 53.7% (95) of the students had not consumed jam in the last seven days.

4.6.8 Frequency of Consumption of Sweets and Sugar

This study found it useful to determine the frequency with which students consumed sweets and sugar in the last one week. Table 4.13 shows the results.

Table 4. 14: Sweets and Sugar Taken in the past 7 days

The types of sweets and sugars consumed for the past week are presented on this table.

Types of Sugars and Sweets.		Never	Once	2 times	3 times	4 times	5 times
Honey	Freq	112	22	6	14	7	16
	%	63.3%	12.4%	3.4%	7.9%	4%	9%
Sugar	Freq	52	16	19	14	14	62
	%	29.4%	9%	10.7%	7.9%	7.9%	35%
Cake	Freq	79	29	22	14	14	19
	%	44.6%	16.4%	12.4%	7.9%	7.9%	10.7%
Biscuits	Freq	74	30	16	11	17	29
	%	41.8%	16.9%	9%	6.2%	9.6%	16.4%
Sweets	Freq	85	25	12	18	14	23
	%	48%	14.1%	6.8%	10.2%	7.9%	13%

The results indicated that 9% (16) of the participants consumed honey 5 times in the past 7 days, 4% (7) four times, 7.9% (14) three times, 3.4% (6) twice, 12.4% (22) once; while 63.3% (112) of the students never consumed honey in the last 7 days.

Besides, 35% (62) of the students had consumed sugar five times in the past 7 days, 7.9% (14) four times, 7.9% (14) three times, 10.7% (19) twice, 9% (16) once; while 29.4% (52) had not consumed any honey in the past 7 days. Generally, there was more consumption of sugar compared to honey.

The results showed that 10.7% (19) of the students had consumed cakes five times, 7.9% (14) four times, 7.9% (14) three times, 12.4% (22) twice, 16.4% (29) once; however, 44.6% (79) had not consumed cakes during the last seven days.

The results from the study indicated that 16.4% (29) of the participants consumed biscuits five times in the last 7 days, 9.6% (17) four times, 6.2% (11) three times, 9% (16) twice, 16.9% (30) once and 41.8% (74) did not consume any biscuits at all.

Finally, the study established that 13% (23) of the students had consumed sweets five times in the last 7 days, 7.9% (14) four times, 10.2% (18) three times, 6.8% (12) twice, 14.1% (25) once; though 48% (85) of the students had not consumed sweets in the last 7 days.

4.7 Physical Activity and Socio-Economic Status

Results indicate that boys were much more physically active than girls $t(175)=2.754$, $p=.007$. The Pearson correlation analysis did not show statistically significant relationship between the participants' socioeconomic status and physical activity. SES was not a significant indicator of physical activity or sedentary behaviour in adolescents attending private boarding schools in Uasin-Gishu County.

4.8 Relationship between Variables and Physical Activity Participation

This section interprets the results of correlation between, gender, SES, diet and participation in PA. Pearson correlation was used to explore the relationship among the variables. Pearson's correlation coefficient was computed to show the strength of the relationships. The significance was indicated using the asterisks** adjacent to the correlation coefficient. One asterisk* denoted significant correlation at .05 (5%); whereas Two asterisks ** denoted significant correlation at .01 (1%). The coefficients without the asterisks were not significantly related and the strength of the relationship was negligible.

4.8.1 Relationship between Gender and Participation in Physical Activity

The first objective was to determine the relationship between gender and participation in physical activity among high school students aged 14-18 in private boarding schools in Uasin-Gishu County. The Pearson's correlation, which measures the strength and

direction of the relationship between two or more variables, was used to determine the relationship between gender and physical activity participation among high school students aged 14-18 in private boarding schools in Uasin-Gishu County. Findings indicate a significant relationship between gender and participation in physical activity as shown by $r = .204$, $p = .007$.

The null hypothesis H_{01} postulated that that there would be no significant relationship between gender and participation in physical activity among high school students aged 14-18 years attending private boarding schools in Uasin-Gishu County. Findings in **Table 4.14** indicate there is a negative but significant relationship between gender and participation in physical activity ($r = -.204$ $p=.007$). Thus, the null hypothesis which stated that there would be no significant relationship between gender and participation in physical activity among high school students aged 14-18 years in private boarding schools in Uasin-Gishu County was not accepted ($p < .01$).

Table 4. 15: Relationship between Gender and Physical Activities

Variables (N = 177)	1	2	3
Participation in PA	1		
Pearson Correlation			
Sig.(2-tailed)			
Gender	-.204**	.007	1
Pearson Correlation			
Sig.(2-tailed)			

**Correlation significant at $p = .01$

4.8.2 Relationship between Participation in Physical Activity and Socio-Economic Status

The second objective related to participation in physical activity and socio-economic status. Hypothesis H0₂, that there would be no significant relationship between parental SES and participation in physical activity, was assessed by examining the presence of significant correlation between SES and PA. Results of Pearson correlation analysis revealed that there was no significant correlation between SES and PA among high school students aged 14-18 years in private boarding schools in Uasin-Gishu County.

Based on the results in **Table 4.15**, the null hypothesis H0₂ that there would be no significant relationship between parental SES and participation in physical activity among high school students aged 14-18 years in private boarding schools in Uasin-Gishu County, was accepted since no significant correlation ($r = .009$, $p = .903$) was found. There is sufficient evidence from the correlation analysis that SES does not affect participation in PA among students aged 14-18 in private boarding schools in Uasin-Gishu County.

Table 4. 16: Relationship between SES and Physical Activity

Variables (N = 177)		1	2	3
Participation in PA	Pearson Correlation	1		
	Sig.(2-tailed)			
SES	Pearson Correlation	.009	.903	1
	Sig.(2-tailed)			

4.8.3 Relationship between Diet and Participation in Physical Activity

The third aim of the study was to examine any correlation between diet and participation in Physical activity among students aged 14-18 in private boarding schools in Uasin-Gishu County. Pearson correlation showed a significant positive relationship

($r = .546$, $p = .288$) between diet and PA among the participants

The null hypothesis, which stated that there would be no significant relationship between diet and participation in physical activity, was therefore rejected ($r = .546$, $p < .01$). Findings in Table 4.16 indicate relationship between diet and PA. The hypothesis was not supported because foods consumed by the participants was connected with PA.

Table 4. 17 Relationship between Diet and Physical Activity

Variables (N = 177)	1	2	3	4
Participation in PA Pearson Correlation	1			
	Sig. (2-tailed)			
Diet Sig.(2-tailed)	.546**	-.288**	-.055	1

**Correlation significant at $p = .01$

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.1 Introduction

The purpose of this study was to determine the level of PA in adolescents. The discussion relates to the implications of the findings of the study and related literature. The findings are supported by the literature reviewed in Chapter Two that physical activity declines in adolescent years and participation in PA is linked to gender, SES and dietary habits. This chapter discusses key findings related to participation in selected sports activities. Physical Activity in the past 7 days (5.2) and the association between variables of gender (5.3), SES (5.4), dietary behaviour (5.5) and physical activity.

5.2 Physical Activity Participation.

The current study assessed physical activity participation in the previous 7 days among adolescents aged 14-18years. The World Health Organization (WHO,2020) recommends that adolescents accumulate 60 minutes of MVPA daily. More than 40% of respondents reported that they had not engaged in PA frequently during the weekdays. However, 40 per cent of the study participants participated in physical activities during weekends and during PE time, 27.1 per cent (48) participated in MVPA, while 38.4 per cent participated in vigorous physical activity during PE. More than 50% of the participants reported participation in individual sports, such as jogging and walking for exercise.

Findings of the current study are similar to those by Ojiambo et al., (2012), who revealed that adolescents, especially in urban areas in Kenya, spent considerable time in sedentary behaviour. Croteau et al., (2011) attributed the lower rates of physical activity among

Kenyan adolescents to the impact of urbanisation on their lifestyles. A direct comparison of the current study to these two studies, which measured PA objectively, is limited because of design differences in the studies. Participants in the current study reported the frequency of selected activities over a period of one week. Objective measurement of intensity and time spent on various activities did not fall within the scope of this study. Although the approach provided insightful details on participation in physical activity, there is a deficiency in the assessment of physical activity workouts that could be a possible explanation of PA behaviour in school-going adolescents. However, most respondents, particularly girls, did not achieve the recommended PA levels. This may be because girls want to “retain their femininity” rather than become masculine looking. This may therefore refrain them from heavy physical activities. It is believed that an ideal girls’ body should be slender with an hourglass figure (Klomsten et al., 2005; Slater & Tiggemann, 2011). Girls are therefore susceptible to health problems over time emanating from consequences of physical inactivity. Further intervention to increase PA needs to target girls in secondary schools.

5.3 Gender and PA

There was a significant relationship between gender and participation in physical activity. This implied that the null hypothesis which stated that there was no significant relationship between gender and participation in physical activity among high school students aged 14-18 years in private boarding schools in Uasin-Gishu County was rejected.

Girls differed from boys in terms of participation in physical activity. These findings seem to support the view of Oyeyemi et al. (2016) that girls are at high risk of inactivity. According to the current study, girls engage in more sedentary activity than boys. Findings show significant difference in girls and boys. An undesirable attitude towards physical activity among Kenyan girls studying in private schools was evident. These results corroborate with those of Gibson et al. (2013). Their study, concerning Aerobic Capacity, PA and Daily Energy expenditure among Kenyan male and female adolescents in the Nandi region in Kenya, found that boys were more active and trekked longer distances to school than girls. However, it is not possible to draw a strong conclusion on the similarity of the results because of differences in methodology. The Gibson et al. (2013) study used experimental design in their assessment. Possible explanation of the findings could be that girls' participation was less than that of the boys because of perceived barriers such as safety concerns and peer influence that resulted in girls being more sedentary (Spencer et al., 2015).

Although the findings of the current study are similar to those of Nakabazzi et al. (2020), direct correlation would be limited due to differences in the design of the study. Nakabazzi et al. (2020) used accelerometers to establish light, moderate and vigorous physical activity over a period of seven days. They concluded that most 10 to 12 year old children do not comply with the recommended PA guidelines, especially girls, overweight children and those studying in private schools. Information concerning gender and PA levels and socio-demographic correlations of accelerometer measured physical activity by Nakabazzi et al. (2020) provides insight into the physical activity behaviour of adolescents in school environment. Possible explanation for the results in

the current study could be that the participants might have over-reported their engagement in physical activities during the week. However, this is unlikely because the study focussed on preferred PA activities in adolescents. High sedentary behaviour in girls is probably related to BMI status, and body weight (Baharudin et al., 2014). Age could also be a contributing factor to pronounced sedentary behaviour among girls. Brodersen et al, (2007) associated adolescence period with decline in PA, inactivity was noticeable between 11-12 and 15-16 ages, girls were less active than boys and high decline was pronounced in girls.

A similar study conducted in Italy, reported the same findings. Direct comparison of the Italian study and the current study is possible because of similarity in the study design and the use of the IPAQ questionnaire. Rosselli et al., (2020) used the IPAQ questionnaire to establish gender differences in perceived barriers to PA among adolescents. The authors established that girls were less likely to achieve the WHO recommended physical activity levels. In addition to this, the results of the current study confirmed the findings of Gibson et al., (2013) who had earlier set out to determine aerobic capacity, daily PA levels and daily energy expenditure among Kenyan school going adolescents. The Gibson study discovered that boys were more active and trekked longer distances to school than girls. This may be because boys have comparatively higher cardio-respiratory fitness which results to more energy expenditure.

Lubans et al., (2008) established that girls may have relatively small VO_2 max compared to boys. Results of this study showed that boys could be more physically active than girls due to higher cardiorespiratory fitness and their vigorous nature. Furthermore, Ssewanyana et al. (2018) stated that girls are barred from participating due to body image

concerns, fear of exposing some body parts, while the overweight feel embarrassed to participate in PA. Therefore, schools should avail the same sporting opportunities to both boys and girls and encourage more single gender teams that could encourage girls to be more involved in physical activities and improve on their fitness.

5.4 Socio-economic Status and PA

The results showed no statistically significant relationship between the means of the differing levels of parental employment and PA in high school students in private boarding schools. The results revealed no significant relationship between parents' socio-economic status (level of education and employment status) and students' engagement in physical activity. Parents being employed or not employed was not associated to student participation in physical activity.

Findings of the current study endorse those of Swaminathan et al.(2011), whose adolescents' study in India established that there was no statistically significant influence of parental socio-economic status on the participation of adolescents in PA. However, there were methodological differences in the two studies. Whereas Swaminathan et al., (2011), examined changes in intensity and duration of sedentary behaviour and MVPA over a whole year, the current study used a questionnaire to assess PA over one week. Adolescent PA may not necessarily be influenced by parental SES. Kelly et al., (2006) observed that SES did not have impact on sedentary behaviour and PA. The Haddad & Sarti (2020) examination of socio-demographic determinants of health behaviours among Brazilian adolescents revealed insufficient effects of SES in adopting healthy lifestyles. Findings of the current study seem to concur with those of Ajaman et al., (2019), whose

investigation of PA and SES among secondary school students in Croatia did not reveal any significant relationship between PA and SES. The current study also used a similar population age group and same tool as that of Ajman et.al (2019). Like the current study, a short version of IPAQ-A was used to assess SES in relation to PA participation in school going adolescents. Bauman (2000) and Stalsberg and Pedersen (2010) suggested that differences in adolescents PA is unlikely to be associated with SES because children are independently capable of making their own choices without being affected by their parent's social class. This could be a possible explanation for the findings of the current study because while in school, children can make their own lifestyle decisions without involving their parents.

Findings of the present study differ from Wachira et al., (2014) and Micklesfield *et al.* (2014) who reported that children from lower SES backgrounds had higher levels of PA. Particularly, children in lower SES public schools were more physically active. Previous research found that lower maternal socioeconomic status was associated with less sedentary time and less moderate to vigorous physical activity (MPVA) in schools. The current study found no significant relationship between SES and PA. Studies by Wachira et al., (2014) and Micklesfield et al., (2014) looked at physical fitness in school-aged children in Sub-Saharan Africa and found that SES was linked to physical activity participation. A number of tools such as Diet and lifestyle questionnaire, Demographic and Family Health Questionnaire and Neighbourhood questionnaires were used in studies by Wachira et al., (2014) and Micklesfield et al., (2014) to determine Socio-demographic variables associated with PA. Results from another European study that investigated PA interventions among adolescents from high and low SES, showed

increased MVPA in low SES adolescents, while high SES had no significant effect on PA (De Bourdeaudhuij et al., 2011).

Conversely, Dumith et al., (2011) found a constant correlation between poorer income and inadequate PA, the lower the income, the lower the levels of physical activity. Kalusuki et al., (2009) and Nunes et al., (2016) linked low SES to Physical inactivity. According to these studies, adolescents from low SES backgrounds consumed excessive alcohol, had unhealthy diet and were more sedentary. Other studies based on European children (Lämmle et al., 2012; Fernández-Alvira et al., 2013) indicated that children from low SES families had low PA, low sleep time and most time on screens.

The Muthuri et al., (2014) and Hardianto et al., (2020) findings regarding relationship between SES and physical activity are not supported by the findings of the current study. Their studies linked high SES to high sedentary behaviour in adolescents, low aerobic fitness, low PA levels and childhood obesity. Whereas results from the current study did not find any difference in PA levels across SES backgrounds. Ferreira et al. (2016) and Piola et al., (2019) reported positive associating with high SES and inadequate PA and high screen time in adolescents, particularly among girls. Sedentary rates were generally higher among students from higher SES. Although the Ferreira et al., (2016) and Piola et al., (2019) studies examined gender and PA participation, the study populations differed because the Ferreira and Piola studies focused on both primary and secondary school students.

Doku et al (2013) in their study of Ghanaian adolescents aged (12-15) and (16-18) found that father's higher education level and substantial wealth were associated with more PA.

Even though the findings of the current study were divergent compared to the study by Doku et al., (2013), both studies used the same research design and settings. Other studies by La Torre et al., (2006), Veselska et al., (2011) and Seabra et al., (2011) acknowledged that high SES associated with high PA. Their findings revealed that adolescent physical activity was affected by the socioeconomic status of their families. Parents' educational levels influenced their children's participation in extracurricular activities at school. Parents had a significant influence on their children's active lifestyles. Chen et al., (2014b) linked parental support to increased engagement in PA. Their survey concerning PA and sedentary behaviour among adolescents established that children with parental support and encouragement were more likely to engage in sufficient PA.

The findings of the current study could be explained by the fact that students have access to health information and most schools have sports and recreation facilities. During PE lessons and games' time, students have equal opportunities to participate in PA. Teachers should encourage all students to make use of available facilities and engage in sporting activities while at school.

5.5 Dietary Habits and Physical Activity

The Pearson's correlation between diet and participation in physical activity rejected the null hypothesis suggesting a significant association between diet and PA. Thus, diet has a significant influence on physical activity among private boarding high school students. The assessment of PA levels and the dietary habits over a week yielded meaningful results. According to the study, students in private boarding schools were fed the almost the same type of food in all the schools. The findings concur with those of Kelishadi et

al., (2007) whose research in to dietary patterns and lifestyles among Spanish adolescents and children showed that poor diet is connected to low PA and unhealthy lifestyles. In addition, Pérez-Rodrigo et al., (2017) associated low PA with poor diet that was compounded by less consumption of fruits and vegetables accompanied by high alcohol intake.

Research by Al-Hazzaa et al., (2014) revealed a relationship between healthy diet and PA and the influence of unhealthy eating behaviour to sedentary behaviour. The researchers noted high correspondence between wholesome diet and PA. Inversely, sedentary behaviour was linked to unhealthy diet. This study by Al-Hazzaa et al (2014) showed that intake of fruit, milk and energy drinks had a positive relationship with PA, while high consumption of sugar-sweetened drinks, fast foods and cakes was related to time spent by adolescents on watching television. Results of the Al-Hazzaa et al study can be compared to the results of the current study because the target population for both studies was secondary school adolescent boys and girls. Although, Al-Hazzaa et al., (2014) drew their sample from private and public schools, the data for the current study was obtained from private schools alone.

Some results of the current study corroborate those of Sedibe et al., (2014) and Ros, (2019). The intake of food was significantly consistent with the PA among the participants. Majority of participants in the current study consumed ugali, githeri, vegetables, avocado and bread, which are common in boarding schools. At 71.8% per cent, the findings suggest that most participants consumed ugali; 61.1% ate bread and 58.8% ate vegetables. Ros (2019) associated physical activity and lifestyle with a diet

rich in vegetables, fruits, legumes, nuts, unsaturated fats and fish (Mediterranean diet). The findings of the current study can be compared with the findings of Sedibe et al. (2014) and Ros, (2019) because all the three studies involved examination of PA among secondary school adolescents. However, direct comparison was not possible because data from the earlier studies was not available for comparison.

The results of the current study also agree with those of Jimoh, (2016) who had established that PA and Body Mass Index (BMI) of participants was affected by food intake; and that overweight and obesity limited their involvement in physical activity. The Jimoh research examined the trends of food intake, overweight, obesity and physical activity among secondary school students in Nigeria. The current study also shared design similarity with that of the Jimoh study. Alkahtani et al., (2015) also found that higher intake of fruit, dairy products and vegetables in college students resulted in increased MVPA. The participants followed laid down guidelines for daily physical activity, regular intake of vegetables and fruits. Though the target population was older, there was a substantial association between consumed foods and participation in PA among adolescents.

Findings of the current study contrast with Sosnowska and Linta (2012) and Sinombe, (2018), both of whom found that the lifestyles and PA of urban school students had no relationship with eating habits. These reviews showed that children took part in PA regardless of the type and number of meals per day. They participated actively in team games and during PE classes even when they had no breakfast.

Unhealthy diet, rich in high density energy foods, lead to overweight/obesity in adolescents, affecting participation in PA. Schools should develop health education lessons that promote good dietary habits and physical activity. Parents and school administrators should collaborate to provide students in boarding schools with a nutritious diet that includes fruits and vegetables.

CHAPTER SIX: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter contains the study summary of findings, conclusion and recommendations.

6.2 Summary of the Findings

The summary of this study findings includes a summary on demographic information, diet and physical activity.

6.2.1 Gender

The first goal was to investigate the relationship between gender and participation in physical activity among high school students aged 14-18 in private boarding schools in Uasin-Gishu County. Results showed that there were more female students than male students in private boarding schools in Uasin-Gishu County. Results further showed that gender had a significant effect on participation in physical activity in high school students aged 14-18 in private boarding schools in Uasin-Gishu County. The results of the study suggest that private boarding schools need to prioritize the promotion of PA among adolescents in schools. Schools should put more emphasis on physical activity, especially among girls because biological, cultural and particular gender norms may hinder them from participating in PA.

6.2.2 Social Economic Status

The second objective was to establish whether parental socio-economic status was related to PA among high school students aged 14-18 years in private boarding schools in Uasin-Gishu County. Findings indicate that there was no significant relationship between

parents' socio-economic status (level of education and employment status) and students' engagement in physical activity.

6.2.3 Dietary habits

Participants were requested to recall the foods they had eaten during the previous week. In terms of carbohydrates, the students consumed mostly whole or sifted ugali, white bread, white rice and githeri. However, they rarely consumed whole meal chapati, brown rice, French fries and mandazi. There was low consumption of dairy foods such as fermented milk, skimmed milk and whole fat milk in the past 7 days. Concerning proteins, meat and meat products, at most, the students consumed meat twice in the past 7 days but hardly consumed chicken, fish, sausages and eggs. In terms of plant proteins most participants indicated they frequently consumed dry beans but hardly consumed dry peas and green grams. Kales were the vegetable most frequently consumed in the private boarding schools; while Avocado was the fruit that was repeatedly consumed in the past 7 days. Generally, spreads and beverages, sweets and sugar were rarely consumed. The study's goal was to see if the foods consumed were related to PA participation. The findings indicate that diet had an influence on their participation in physical activity such that higher levels of PA are associated with healthy dietary behaviours among the students.

Hypothesis results showed that there was a significant relationship between diet and participation in physical activity among high school students aged 14-18 years in private schools in Uasin-Gishu County.

6.3 Conclusion

In conclusion, gender has a significant association on the level of participation in physical activity. This could be attributed to the fact that male students tend to be more active in physical activities than female students due to the societal roles that emphasize physical activities for the boys. The study also concludes that it is important for both girls and boys to be encouraged to participate in physical activities but with a little more emphasis on the girls.

The study further concluded that parents' SES has no influence on the students' level of participation in physical activity. The findings imply that students in private boarding schools in Uasin-Gishu County are exposed to the same physical activity environment irrespective of their social backgrounds because they have access to the same sports facilities such as playgrounds and are required to participate in PA during PE lessons and games time. Irrespective of whether a parent works or not, or possess higher academic qualification, it has no bearing on the level of participation in physical activity. Basically, being in a private boarding school suggests that the students have an equal opportunity to engage in PA.

Finally, the study established that the students' diet had a positive impact on their participation in physical activity. This implies that higher levels of PA are associated with healthy dietary behaviours among the students. The positive correlation between diet and PA could also be attributed to the fact that there was less consumption of spreads and beverages as well as sweets and sugar which contribute to sedentary behaviour. There

was also more consumption of energy giving foods such as ugali and githeri which perhaps provided higher energy to participate in and sustain PA.

6.4 Recommendations

This section highlights the recommendations of the study. It contains recommendations for practice, policy and for further researches.

6.4.1 Recommendations for Practice

Private boarding schools' management should be aware of the challenges that hinder girls from engaging in PA to develop practical personal strategies. Exposure and change in sociocultural norms could be the starting point for addressing the gender disparity in physical activity. Health promotion initiatives to enhance physical activity should target girls because they are at a higher risk of physical inactivity. Factors affecting girls' participation in PA such as concern for their body figures, need to be addressed by PE teachers acting as role models and using media like posters to disseminate health information to increase awareness and their PA participation.

The study has established that the parents' socio-economic status has no relationship with the level of participation in physical activity. Emphasis should therefore, be on the physical education and sports programmes in the private boarding schools since it is the only environment that provides an equal opportunity for students to participate in PA. In this regard, teachers and coaches in schools need to be supportive of PA and teach the students the skills needed to feel competent for engaging in PA. Most importantly, the schools need to offer quality physical education programme.

The Ministry of Education and school administrators should emphasize the importance of Physical Education and a healthy diet in private schools to increase physical activity levels and encourage healthy lifestyles. Interventions for physical activity and diet education can be incorporated into existing school curriculum.

6.4.2 Recommendations for Policy

In light of the findings and conclusion of the study, the following policy recommendations were made:

- i. The Ministry of Education (MOE) and school administration can develop policies that focus on girls PA because biological dispensations and societal norms may prevent them from participating in PA.
- ii. MOE should develop policies that incorporate nutrition education into the curriculum in order to ensure that adolescents have adequate knowledge of dietary habits, which is essential in their physical activity.

6.5 Recommendations for Further Researches

The following research recommendations were made:

- i. Research can be conducted on sociocultural norms that affect girl's PA.
- ii. The relationship between SES and physical activity in public schools can be assessed.
- iii. There is need to conduct longitudinal studies on nutrition and physical activity among school-aged adolescents.

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APPENDICES

APPENDIX I: QUESTIONNAIRE

Instructions:

You are requested to answer the following questions regarding Physical activity participation.

- a) There are no right and wrong answers — this is not a test.
- b) Please answer all the questions as honestly and accurately as you can — this is very important.

SECTION A; DEMOGRAPHIC INFORMATION AND SOCIO-ECONOMIC STATUS

Tick (✓) one response

- 1. Kindly indicate your gender
- 2. What is your father's/guardians highest level of education?

No education

Primary School

Technical college

University

- 3. What is your mother's highest level of education?

No education

Primary School

Technical college

University

4. Are your parents/guardians working?

Yes

No

5. What is your father's/guardian's occupation?

Casual labourer specify

Self-employed specify

Regularly employed Specify

Any other.....

6. What is your mother's occupation?

Casual labourer specify

Self-employed specify

Regularly employed Specify

Housewife

Any other

SECTION B: PHYSICAL ACTIVITY (PAQ-A)

I am trying to determine your level of physical activity during last 7 days (in the last week). This includes sports, dances and or any physical activities that have made you sweat, made your legs feel tired and made you breathe hard, like tag, skipping, running, and climbing. There may have been others that I have not mentioned above.

1. Physical activity in your free time: Have you done any of the following activities in the past 7 days (last week)? If yes, how many times? (Mark \checkmark only one square per row.)

No 1-2 3-4 5-6 7times or more

Please ensure all the boxes align horizontally and vertically. This does not look professional

Skipping.....

Walking for exercise.....

Jogging or running.....

Swimming.....

Baseball, softball.....

Dance.....

Badminton

Football

Volleyball

Field hockey

Basketball.....

Other:.....

2. In the last 7 days, during your physical education (PE) classes, how often were you (playing hard, running, jumping, throwing)? (Tick one only.)

THROUGHOUT THE
APPENDICES ALIGN BOXES

I don't do PE.....

Hardly ever.....

Sometimes.....

Quite often.....

Always.....

3. In the last 7 days, what did you do most of the time at rest? (Tick one only.)

Sat down (talking, reading, doing schoolwork).....

Stood around or walked around.....

Ran or played a little bit.....

Ran around and played quite a bit.....

Ran and played hard most of the time.....

4. In the last 7 days, what did you normally do at lunch (besides eating lunch)?

(Tick one only.)

Sat down (talking, reading, doing schoolwork).....

Stood around or walked around.....

Ran or played a little bit.....

Ran around and played quite a bit.....

Ran and played hard most of the time.....

5. In the last 7 days, on how many days right after school, did you do sport, dance, or play games? (Tick one only.)

None.....

1 time last week.....

2 or 3 times last week.....

4 times a week.....

5 times last week.....

6. In the last 7 days, on how many evenings did you do sports, dance, or play games? (Tick one only.)

None.....

1 time last week.....

2 or 3 times last week.....

4 or 5 last week.....

6 or 7 times last week.....

7. On the last weekend, how many times did you do sports, dance, or play games? (Tick one only.)

None.....

Once.....

2 — 3 times.....

4 — 5 times.....

6 or more times.....

8. Which one of the following describes you best for the last 7 days? Read all five statements before deciding on the one answer that describes you.

a) All or most of my free time was spent doing things that involve little physical effort.....

b) I sometimes (1 — 2 times last week) did physical things in my free time (e.g. played sports, went running, swimming, bike riding, did aerobics).....

c) I often (3 — 4 times last week) did physical things in my free time.
.....

d) I quite often (5 — 6 times last week) did physical things in my free time
.....

e) I very often (7 or more times last week) did physical things in my free time
.....

9. Mark how often you did physical activity (like playing sports, games, doing dance, or any other physical activity) for each day last week.

	None	Little bit	Medium	Often	Very often
Monday.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tuesday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wednesday.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thursday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Friday.....

Saturday

Sunday

10. Were you sick last week, or did anything prevent you from doing your normal physical activities? (Tick one.)

Yes

No.....

If yes, what prevented you?

SECTION C: DIET QUESTIONNAIRE

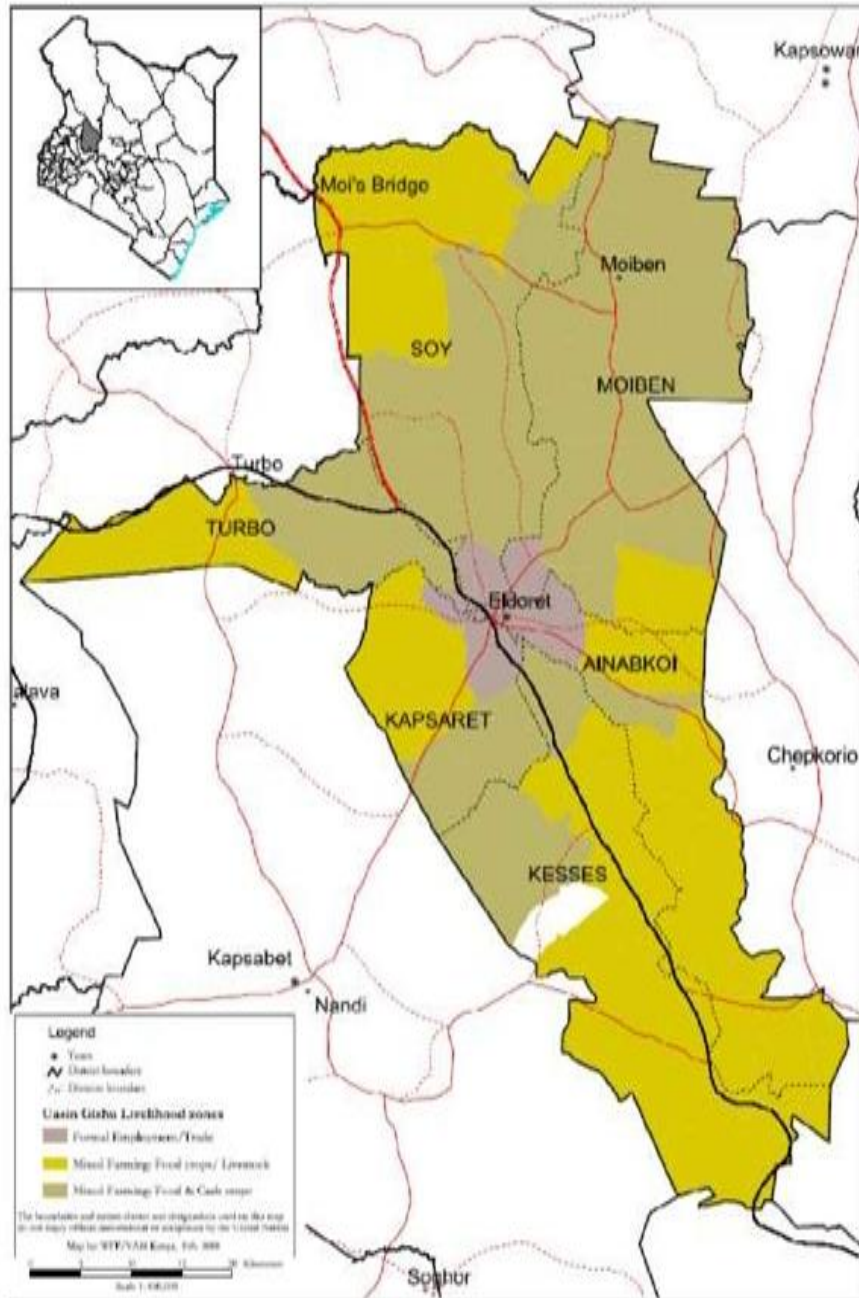
I would like to know your diet for the last one week. Show the number of times and the food consumed by putting a tick (√).

How many times did you eat the following foods in the last seven days?

	Consumption frequency in the last one week(Tick one)					
	Once	2 times	3 times	4 times	5 times	Never
Carbohydrates, cereals and Starch						
Ugali whole or sifted						
White bread						
Brown/Whole meal bread						
White rice						
Brown rice						
Whole meal chapatti						
Sifted flour chapatti						
Githeri						
Maandazi						
Frech fries/chips						
Others specify						
Dairy foods						
Dairy food						
Whole fat milk						
Low fat milk						
Skimmed milk						
Fermented milk(mala)						
Others specify						
Proteins, meats, meat products						
Beef						
Chicken						
Fish						
Sausage bacon, meat smokies						
Eggs						
Others Specify						
Legumes/pulses and nuts						
Dry beans						
Green grams						

Groundnuts						
Dry peas						
Others specify						
Vegetables						
Kales/Sukuma wiki						
Cabbage						
other African leafy vegetables						
Fruits						
Bananas						
Avocado						
Passion						
Oranges and lemon						
Pineapple						
Others specify						
Spreads and beverages						
Juice						
Soda						
Peanut butter						
Margarine						
Jam						
Others specify						
Sweets and Sugar						
Honey						
Sugar						
Cake						
Biscuits						
Sweets						
Others specify						

APPENDIX II: MAP OF UASIN-GISHU COUNTY



APPENDIX III: GRADUATE SCHOOL AUTHORIZATION



KENYATTA UNIVERSITY GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke

P.O. Box 43844, 00100

Website: www.ku.ac.ke

NAIROBI, KENYA
Tel. 020-8704150

Internal Memo

FROM: Dean, Graduate School

DATE: 13th June, 2017

TO: Rotich Jepkorir Noellie
C/o Physical & Health Education
Department.

REF: H108/22667/11

SUBJECT: APPROVAL OF RESEARCH PROPOSAL
=====

This is to inform you that Graduate School Board, at its meeting of 7th June, 2017, approved your Research Proposal for the M.Sc. Degree entitled "Levels of Physical Activity among Students Aged 14-18 in Private Boarding Secondary Schools in Uasin Gishu County, Kenya".

You may now proceed with your Data collection, subject to clearance with the Director Ethics Office Kenyatta University and the Director General, National Commission for Science, Technology and Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking Forms per semester. The form has been developed to replace the Progress Report Forms. The Supervision Tracking Forms are available at the University's Website under Graduate School webpage downloads.

Thank you.

EDWIN OBUNGU
FOR: DEAN, GRADUATE SCHOOL



CC. Chairman, Physical and Health Education Department

Supervisors:

1. Dr. Lucy Joy Wachira
Department of Physical and Health Education
Kenyatta University
2. Dr. Yasmin Goodwin
C/o Department of Physical and Health Education
Kenyatta University

EO/rwm

APPENDIX IV: KENYATTA UNIVERSITY ETHICS APPROVAL



KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE

Fax: 8711242/8711575
Email: kuerc.chairman@ku.ac.ke
kuerc.secretary@ku.ac.ke
Website: www.ku.ac.ke

P. O. Box 43844,
Nairobi, 00100
Tel: 8710901/12

Our Ref: KU/ERC/ APPROVAL/VOL.1 (131)

Date: 14th June, 2018

Rotich Jepkorir Noelle,
P.O Box 139 - 30102
Burnt Forest

Dear Rotich,

APPLICATION NUMBER: PKU/718/1788 "LEVELS OF PHYSICAL ACTIVITY AMONG STUDENTS AGED 14 – 18 IN PRIVATE BOARDING SECONDARY SCHOOLS IN UASIN GISHU COUNTY, KENYA"

1. IDENTIFICATION OF PROTOCOL

The application before the committee is with a research topic "Levels of Physical Activity among Students Aged 14 – 18 in Private Boarding Secondary Schools in Uasin Gishu County, Kenya" received on 18th December, 2017 and discussed on 12th June, 2018

2. APPLICANT

Rotich Jepkorir Noelle

3. SITE

Uasin Gishu County

4. DECISION

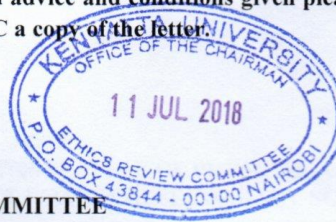
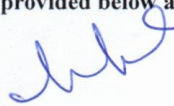
The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (section 7.2.1.3) and the Kenyatta University Ethics Review Committee Guidelines and **APPROVED** that the research may proceed for a period of **ONE year from 12th June, 2018.**

5. **ADVICE/CONDITIONS**

- i. Progress reports are submitted to the KU-ERC every six months and a full report is submitted at the end of the study.
- ii. Serious and unexpected adverse events related to the conduct of the study are reported to this committee immediately they occur.
- iii. Notify the Kenyatta University Ethics Committee of any amendments to the protocol.
- iv. Submit an electronic copy of the protocol to KUERC.

When replying, kindly quote the application number above.

If you accept the decision reached and advice and conditions given please sign in the space provided below and return to KU-ERC a copy of the letter.



DR. TITUS KAHIGA
CHAIRMAN ETHICS REVIEW COMMITTEE

I Rotich, J. Noelle accept the advice given and will fulfill the conditions therein.

Signature Rotich Dated this day of 11th July 2018.

cc.
DVC-Research Innovation and Outreach

APPENDIX V: NACOSTI RESEARCH PERMIT



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349,3310571,2219420
Fax: +254-20-318245,318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/17/70511/18750**

Date: **17th August, 2017**

Noelle Jepkorir Rotich
Kenyatta University
P.O. Box 43844-00100.
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“Physical activity levels among students aged 14-18 in private boarding secondary schools in Uasin Gishu County, Kenya,”* I am pleased to inform you that you have been authorized to undertake research in **Uasin-Gishu County** for the period ending **17th August, 2018.**

You are advised to report to **the County Commissioner and the County Director of Education, Uasin-Gishu County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Uasin-Gishu County.

The County Director of Education
Uasin-Gishu County.

APPENDIX VI: MINISTRY OF EDUCATION AUTHORIZATION



REPUBLIC OF KENYA
MINISTRY OF EDUCATION
(State Department for Basic Education)

Telegrams: "EDUCATION", Eldoret
Telephone: 053-2063342 or 2031421/2
Mobile : 0719 12 72 12/0732 260 280
Email: cdeuasingishucounty@yahoo.com
: cdeuasingishucounty@gmail.com

Office of The County Director of Education,
Uasin Gishu County,
P.O. Box 9843-30100,
ELDORET.

When replying please quote:

Ref: No. MOE/UGC/TRN/9/VOL.3/33

Date: 17th JULY, 2017

ROTICH JEPKORIR NOELLE
KENYATTA UNIVERSITY
P.O BOX 43844-00100
NAIROBI

RE: RESEARCH AUTHORIZATION

This office has received your letter requesting for an authority to allow you carry out a research on "*Levels of physical activity among students aged 14-18 in private schools in uasin gishu county, Kenya,*" Within Uasin Gishu County.

We wish to inform you that the request has been granted for a period ending, **December 2017**. The authorities concerned are therefore requested to give you maximum support.

We take this opportunity to wish you well during this research.

FOR COUNTY DIRECTOR OF EDUCATION
UASIN GISHU COUNTY
P. O. Box 9843, ELDORET
Tel: 0719-127 212/ 053-2063342

VIOLA KIGEN
For: COUNTY DIRECTOR OF EDUCATION
UASIN GISHU



APPENDIX VII: INFORMED CONSENT

The consent form was signed by the teacher, who served as the students' guardian.

My name Jepkorir Rotich I am a Masters student from Kenyatta University. I am conducting a study on “**Physical Activity, Gender, SES, and Diet among students aged 14-18 in Private Boarding Schools In Uasin-Gishu County**”. The information will be used by the Ministry of Sports, Culture and Arts improve participation in sports among high school students in Uasin-Gishu County as well as other counties in Kenya.

Procedures to be followed

Participation in this study will require you to answer the questions in the questionnaires that you will be given. You have the right to refuse participation in this study. This will not affect your day to day life in school.

Please remember the participation in this study is voluntary. You may ask questions related to the study at any time. You may refuse to respond to any questions. You may stop being in the study without any consequences.

Discomfort and Risks

Some of the questions you will be asked may make you uncomfortable. If this happens, you may refuse to answer the questions if so you choose. You may stop filling the questionnaire at any time.

Benefits

If you participate in this study you will help us to know the levels of Physical activity and plan Physical activity programs that will enhance participation in Physical Activity among High school students.

Reward

If you agree to take part in this study you will be given a pen

Confidentiality

Your name will not be recorded on the questionnaire. The questionnaire will be kept in a locked cabinet for safekeeping at Kenyatta University. Everything will be kept private.

Contact Information

If you have any questions you may contact; 1.Dr. Lucy-Joy Wachira on 0723842543 or 2.Dr.Yasmin Goodwin on 0724935594 or the Kenyatta University Ethical Review Secretariat on chairman .kuerc@ ku.ac.ke, secretary.kuerc @ku.ac.ke, secretariat.kuerc@ ku.ac.ke

Participant's statement

The above information regarding my participation in the study is clear to me. I have been given a chance to ask questions and my questions have been answered to my satisfaction. My participation in this study is entirely voluntary. I understand that my records will be kept private and I can leave the study at any time. I understand that this will not affect my daily routine in school whether I decide to leave the study or not and my decision will not affect my performance in school at any time.

Name _____ of _____ the
Participant.....

Signature

Date

Investigators Statement

I, the undersigned, have explained to the volunteer in a language s/he understands the procedures to be followed in the study and the risks and benefits involved.

Name _____ of _____ the
Interviewer.....

Signature

Date

APPENDIX VIII: PRINCIPAL'S PERMISSION

Dear Sir/Madam,

Re: Permission to conduct research at your school.

I am pursuing a Master's degree at Kenyatta University's department of Physical Education, Exercise and Sport Science. I am conducting research on the relationship between gender, socioeconomic status, diet, and physical activity among students aged 14 to 18 in Uasin-Gishu County private boarding schools. Your school is among the sample of the research study and the students' data will be collected as part of the research.

Before the research begins, participants will be asked to provide written or verbal consent. Their responses will be treated confidentially, and their identities (their names and the name of the school) will be kept anonymous unless expressly stated otherwise. Individual privacy will be protected.

The research will entail collecting data from the students. Participants will be asked to provide their written consent before the research begins. Their responses will be treated with confidentially, and identities (their names and the name of the school) will be kept anonymous. Individual's confidentiality will be maintained in all published and written data resulting from the study.

The research participants in the study will not be advantaged or disadvantaged in any way. They will be reassured that they can withdraw their permission at any time during this project without any incurring any penalty. There are no foreseeable risks in participating in this study. I therefore request permission to conduct my research at your school.

Please let me know if you require any further information. I look forward to your response as soon as is convenient.

Yours sincerely,

Student: Rotich N Jepkorir

Supervisors: Dr. Lucy-Joy Wachira and Dr. Yasmin Goodwin.

APPENDIX IX: INFORMED ASSENT

This was for the students who participated in the study.

My name is Noelle, a student at Kenyatta University. I am conducting a research study on participation in physical activity among students. Research is a method of learning more about something. I am asking you to participate in this research study so that I can learn more about physical activity. I would like to know the types of exercises children between the ages of 14 to 18 engage in and what kinds of food they eat.

If you agree, you will be required to complete a questionnaire. You will be asked how frequently you exercise and what type of exercises you perform. You will also be asked the kind of foods you consume. You will be asked to provide your parents' occupation and education level. Answering these questions will take about 1 hour.

You do not have to write your name on the questionnaire. Participation in the study is voluntary. Even if your teachers say you can talk to us, you do not have to do so. Even if you say yes, you may change your mind and stop at any time. You may also choose to not answer a question for any reason. You may ask questions about the study.

If you decide to participate in the study, I will not reveal anything you say or do during the study to anyone else. I will not tell your parents or teachers about what you say or do in the study, even if they ask. Signing here indicates that you have read this form or had it read to you, and that you agree to participate in this study.

Participant's name _____

Signature of participant _____

Signature of investigator _____ Date _____