



**UNIVERSITY OF ZULULAND**

**IMPACT OF OBESITY ON LEARNER ACADEMIC PERFORMANCE IN RURAL  
SECONDARY SCHOOLS IN VHEMBE DISTRICT**

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## DECLARATION

I, Thenga Nwkwana Emily, declare that this thesis, entitled “**Impact of obesity on learner academic performance in rural secondary schools in Vhembe District**” is my own work, both in content and execution. All the resources I used for this study are cited and duly referenced. Apart from the normal guidance from my supervisor, I have received no assistance, except as cited in the acknowledgements. I declare that the content of this thesis has not been submitted in lieu of any qualification at this or any other tertiary institution.



**28 MARCH 2022**

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**Date**

## **ABSTRACT**

The emerging scourge of overweight and obesity are attributed to the consumption of high energy-dense foods, poor nutrition, lifestyle transition and little physical activity which cause serious developmental health problems, psychological complications and cognitive dysfunction. These debilitating challenges consequently affect children's growth and development and result in academic under-achievement. The aim of this study was to assess the impact of obesity on learner academic performance in rural secondary schools in Mvudi circuit of Vhembe district. This study used Convergent Parallel Mixed Method Design in collecting data through questionnaires and in-depth face-to-face interviews and observations. Simple random sampling procedure was used to select 125 school learners and purposive sampling was used to select 5 teachers and 5 learners from the five rural secondary schools in Mvudi circuit of Vhembe district, Limpopo Province, South Africa. The study findings established that obesity has the capability to directly impair the physiological, psycho-social and economic dimensions of learners which exert an impact on academic performance. Overall, variables such as nutrition, gender, physical inactivity, industrialisation, sedentary lifestyle and bullying negatively affect academic performance. Government sectors, teachers, parents and learners should work together in addressing the challenges caused by obesity as it exerts an adverse impact on the academic attainment of learners.

**KEYWORDS:** academic performance, bullying, COVID 19, excessive weight, food energy density imbalance, nutrition, physical inactivity, sedentary lifestyle, socio-economic status.

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## **CHAPTER 1**

### **1.1 BACKGROUND OF THE STUDY**

Child obesity has become a pandemic, and its prevalence rates continue to rise. Studies conducted in the United States of America (Ogden, Carroll, Curtin, McDowell, Tabak, and Flegal, 2006; Gill, Gjelsvik, Mercurio, & Amanullah, 2021) illustrate that 1 in 3 children and youth aged between 6 and 19 years are obese, which is regarded as Globesity. In one of its studies, the World Health Organisation (2013) confirmed that children with obesity present a severe public health challenge for the 21<sup>st</sup> century. This pandemic affects the entire aspects of the life of a child, mainly ill health, obesity and negative social perceptions wherein society ascribes social stigma to obese children. Some of the latest studies have demonstrated that if childhood obesity is not controlled, it could lead to co-morbidities (McMullan, Millar & Woodside, 2020; WHO, 2013) which are associated with poor academic skills and feeble academic attainments (Gill et al., 2021).

The literature on the challenges of overweight illustrates that South Africa has the highest obesity prevalence globally. This obesity constitutes an epidemic that calls for urgent action. A report in 2012 posits that interventions to curb the rise in obesity among children in South African children are needed (Shisana, Labadarios & Rehle, 2013). This same report states that childhood obesity prevalence for South African children is at 36.5%, which is higher than the global prevalence of 10% among school children (Gupta, Goel, Shah & Misra, 2012).

Evidence from statistics shows that obesity has risen to be a major obstacle that needs urgent attention in South Africa. The occurrence of children with obesity is still increasing in most countries, including South Africa, and is associated with immediate and long-term medical consequences. Singhal, Herd, Adab and Pallan (2020) argue that the worldwide prevalence of obesity has dramatically risen in the last four decades from 4% in 1975 to over 18% in 2016 and is expected to surpass moderate and severe underweight by 2022.

Obese children are the victims of non-communicable diseases such as Type II diabetes, hypertension, cardiovascular diseases, social stigmatisation, social rejection, social discrimination, negative stereotyping, and mental health problems. Subsequently such experiences lead to negative consequences such as socially negative stigma and socially devalued identity. Learners experience challenges such as discrimination, rejection, teasing, and maltreatment which also generate low self-esteem and mood swings. There is also a belief that overweight, or obesity has significant psychological consequences (Wardle & Cooke, 2005; Hunger & Major, 2015).

This observation is also confirmed by Harriger and Thompson (2012) who state that obese children encounter discrimination and negative teasing in their lives. This social ostracisation comes from teachers, peers, siblings or members of the family. Children with obesity are faced not just with health problems that are physical but also encounter mental health problems such as depression, low self-esteem, as well as other disorders pertaining to moods (Strauss & Pollack, 2003). Low self-esteem has been associated with depression (Puhl & Suh, 2015). This is because the experience of low self-esteem emanating from an awareness of an individual's state of obesity arouses feelings of depressed self-worth.

Vhembe, a rural district where Mvudi circuit is located, is in the Limpopo Province of South Africa. It is characterised by economically disadvantaged communities. Since eating habits are associated with an individual's body mass index, it is possible that obese children are also found in Vhembe District. Due to poverty, children just eat what they are offered at home as they do not have any choice of the food that they consume. The standards of living nearly correlate with race in South Africa. Poverty in South Africa is concentrated among blacks although not restricted to this racial group (Statistics South Africa, 2000). Vhembe is a poverty-stricken rural district largely inhabited by a poor black society. According to StatsSA (2000), Vhembe is experiencing the ballooning problem of child obesity, causing significant challenges in education that manifests in poor academic performance.

## 1.2 OBESITY DEFINED

Hebebrand, Holm, Woodward, Baker, Blaak, Schutz and Yumuk, (2017: 2) concur with WHO, (2020) that “obesity is generally defined as the abnormal or excessive accumulation of fat in adipose tissue to the extent that health may be impaired.” For Campbell and Haslam (2005:2), excess adiposity is described as ‘obesity’ and this condition further results in an augmented threat emanating from related co-morbid disease. The body mass index (BMI) serves as the diagnosis for obesity and is considered a replacement of percentage fat mass. Some studies (Pignone & McPhee, 2007; Mair, Gaw, & MacLean, 2020) concur that obesity is an excess of adipose tissue. Obesity means being overweight through the accumulation of excess fat within the body.

Obesity is an aspect of the image of the body which is measured based on that which a given society regards as an acceptable body size. Researchers often consider the terms ‘overweight’ and ‘obesity’ as synonymous, referring to the quantity of body fat (De Garine & Pollock, 1995: xiv; Mair, Gaw, & MacLean, 2020). A BMI that equals 25 or greater is taken as overweight, while that which equals 30 or above is considered obese (WHO, 2015a). This categorises children whose BMI equals or exceeds the 85th percentile as overweight while those at the 95th percentile and greater are considered obese (Kuczmarski et al., 2000).

Obesity is a multi-dimensional concept which requires an appropriate approach. Alleyne and LaPoint (2004: 30) describe “obesity because of an intake of energy which exceeds its expenditure over a significant period.” This definition is considered uncomplicated and appropriate as it directly links to the causes of obesity such as poor diet intake and inactivity. Campbell and Haslam (2005: 2) state that the calculation of the Body Mass Index (BMI) of an individual defines obesity.

### **1.3 PREVALENCE OF OBESITY ON LEARNERS**

This section discusses the prevalence of obesity which has affected individuals of various ages and socioeconomic groups in both developed and developing countries.

#### **1.3.1 Global trends of obesity**

Obesity has increased globally and has reached a plateau prevalence around the world (Lobstein & Jackson-Leach, 2016). It has been estimated that 91 million children will have obesity in 2025 (Ma, Gao, Chiu, Ding, Wang & Wang, 2020). China, which is considered one of the largest among developed countries, has seen a significant rise in the number of obese people. With a population of approximately 1.4 billion, China has seen the number of obese people triple in the past decade (Ma, Cai, & Wang, 2012). From an initial figure of 7.1% in 2002, the number of obese children in China rose to 13.6% in 4th grade boys and girls (Zhao, Liu, Yu, et al., 2018); while Zhen, Ma, Zhao, Yang, & Wen, 2018; Zhou, Ye, Fu, Li, Yuan, Yang, & Yan, (2020) concur that one-fifth of all children in China are obese.

The prevalence of obesity is linked, among other factors, to deprivation, urbanisation, modernisation, new technologies and the influence of mass media which encourage the consumption of energy-dense foods and reduced physical activity (Singhal, Herd, Adab & Pallan, 2020). When the style of life changes, the body weight also changes as these variables are strongly dependent to each other. As evidence of the rocketing of obesity, in 2014 China recorded 28.2% of adolescents as obese (Wang, Dong, Wang, Zou & Ma, 2017). In addition to its well-known physical health risks, overweight and obesity has been found to have detrimental effects on child academic performance (Morita, Nakajima, Okita, Ishihara, Sagawa & Yamatsu, 2016). WHO (2016) states that obesity serves as the fifth most prominent source of non-communicable diseases in the world.

This concurs with Faienza, Chiarito, Molina-Molina, Shanmugam, Lammert, Krawczyk, & Portincasa, (2020); Li, Schoufour, Wang, Dhana, Pan, Liu & Hu, (2020); Sushma, Devi & Priya, (2020) who assert that diseases such as juvenile diabetes, cardiovascular diseases, orthopaedic complications and mortality are co-morbidities to obesity across the globe. Obesity has been identified as a condition that alters metabolism and causes psychosocial disorders such as low self-esteem, anxiety, social isolation, social stigma and obesogenic eating disorders resulting in poor academic performance.

In the United States of America obesity has become a major public health epidemic among American children. Childhood obesity increased by 47.1% between 1980 and 2013 (Ng, Fleming, Robinson, Thomson, Graetz & Margono, 2014). Research on obese children confirms that 12.5 million or 17% of children aged between 2 and 19 years are obese in America (Vazquez<sup>1</sup> & Cubbin, 2020; CDC, 2014). In USA, the fraction of the population that is either overweight or obese stood at 50% in 2004 (Wang, 2004).

A combination of the number of learners who are obese with those who are at risk amply demonstrates that approximately one third (1/3) of children in the USA have been affected (Hales, Fryar, Carroll, Freedman, & Ogden, 2017). Some studies show a general increase in the occurrence of obesity among learners (Carroll, Kit, & Flegal, 2012), others show stabilisation (Ogden, Carroll, Kit & Flegal, 2014), and some suggest a decline (Moss et al., 2012). According to Blair, MacGregor and Lee (2020), non-Hispanic whites are less obese compared to African-American and Latino children. The rate of prevalence of obesity stood at 22.4% for Latinos and 20.2% for African-American children (CDC, 2014).

In the United States, childhood obesity prevalence has increased by threefold over the past few decades as approximately 18.5% of children aged 2-19 years (13.7 million) had obesity (CDC, 2014; Ruopeng, 2020). Centre for Disease Control (CDC, 2020) corroborates Hales, Fryar, Carroll, Freedman and Ogden, (2017) who indicated that in 2017 and 2018, the percentage of obese school aged youths aged between 2-19 years in the USA has plateaued to 39.1% between 2015 – 2016, which is worrying.

The study by Ruopeng, (2020) shows that the school closures during the outbreak of COVID-19 virus pandemic restrictions for 2 months resulted in an increase in childhood obesity of 0.640% points among U.S. kindergarteners. This rate of increase is predicted to rise by 2.373% points by the end of 2020 if no remedial strategies are found. The study predicted that the spread of the COVID-19 pandemic is likely to create more new cases of childhood obesity by March 2021 (Ruopeng, 2020). Such a scenario can cost the world, inclusive of South Africa, massive loss of academic time which leads to academic underperformance of learners. American obese girl children and those with elevated BMI were found to be associated with a decrease in executive function and long-term poorer school performance (Martin, Booth, McGeown, 2017) and poorer educational outcomes (Anderson, Kirkpatrick, Dolan, Wouldes, Grant, Cave, Wild, Derraik, Cutfield & Hofman, 2019).

In Australia, every one in four children and adolescents of 5 to 17 years are obese (Sylper, 2006). Australia has a major increase in the size of learners that are either obese or overweight (Magarey, Boulton & Daniel, 2001). The acute incidence of obesity in early life attracts negative health conditions such as an increase in the risk of asthma (Calcaterra, Verduci, Ghezzi, Cena, Pascuzzi, Regalbuto, & Zuccotti, (2021) bone fractures (Kimm, 2002) hypertension (Goran & Sothorn, 2006), early cardiovascular disease (Xia, Lloyd-Jones, & Khan, 2019) insulin resistance (Bayer, 2011) and obstructive sleep apnoea (Harrington, 2001).

Two reviews by Dyer, Gomersall, Smithers, Davy, Coleman & Street (2015); and Huse, Hettiarachchi, Gearon, Nichols, Allender & Peeters, (2018) report a rise in the prevalence of obesity in accordance to age among children aged between 5 – 17years to 38.5% in Australia. This shows that obesity can affect all children equally whether from developed or developing countries alike. The rise in the BMI predispose young children to ill- health that cost them to be frequently absent from school that can deter their academic attainment.

### **1.3.2 The trend of obesity in African states**

The prevalence of overweight and obesity in Africa is projected to reach 20%–50% by 2025 (Dagne, Gelaw, Abebe, & Wassie, 2019). The World Health Organisation (WHO, 2018) confirms that obesity prevalence in Africa is at 26.9% and is at an epidemic level, as 41 million learners aged between 5 and 19 years were overweight or obese in the year 2016. Abo El-Maaty, Zaky, Towfik and El-Neshwy (2019) concur with Sserwanja, Mutisya, Olal, Musaba, and Mukunya, (2021) that the prevalence of obesity in Africa has emerged as a public health problem and increased to alarming levels in the last few decades, laced with adverse effects on education attainment.

Obesity acts as an independent risk factor which leads to the development of several non-communicable diseases such as juvenile diabetes, cardiovascular complications and cancer. Karchynskaya, Kopcakova, Klein, Gába, Madarasova-Geckova, van Dijk, and Reijneveld (2020) maintain that the obesity epidemic among learners and adolescents result in an increase in morbidity and mortality rates, as well as a rise in healthcare expenditure and care. These various lifestyle changes exert an impact on learner academic performance in both the developed and developing nations. Africa is moving towards free trade of importing foods from developed countries and globalisation of food markets has resulted in the introduction of unhealthy low-cost and obesogenic processed foods (Abdulai, 2010).

The aggressive promotion of soda drinks and sweet sugary beverages, oil and unhealthy processed foods has also witnessed a surge in their consumption (Labonte & Shreker, 2007). This nutrition transition has triggered the replacement of healthy traditional diets with 'Westernised' diets rich in fats, sugar and nutritionally poor calories (Kopp, 2020; Misra & Bhardwaj, 2014; Goh, Azam-Ali, McCullough, & Roy Mitra, 2020). This westernised diet is low in vegetables and fruit, whole grains, nuts and seeds and high in salt content (Ezzati & Riboli, 2013). This diet has increased links with obesity risks and chronic diseases, which exert an impact on learner academic performance (Aspray, Mugusi, Rashid, Whitin, Edwards, Albert, et al., 2000).



Danasekaran and Ranganathan (2019) note that obesity and overweight have significant long term health consequences such as adult obesity, higher levels of cholesterol, and future incidence of coronary artery disease. The incidence of obesity causes victims to experience negative health consequences which affect grades at school. This takes place because unhealthy learners are compelled to regularly visit health facilities for health reviews and admissions to address related medical challenges (Pinto, Dunstan, Owen, Bonfa & Gualano, 2020). As obesity victims suffer these health consequences, school grades are affected as learning cannot take place in an unhealthy body and this cripples learning and academics.

Mosha and Fungo (2010) conducted a study in Dar es Salaam, Tanzania, and established that knowledge on obesity and its health consequences were limited among children in primary schools. Although this study is conducted among secondary school learners, obesity can affect both primary and secondary school learners alike. Cogill (2003) conducted another study in Kinondoni and Dodoma, Tanzania, and verified that 5.6% and 6.3% of children aged 6–9 in the respective towns were obese. This suggests that obesity can affect people's lives from different social classes and ages. This further implies that such impact may negatively affect children who are at school, thereby influencing their academic performance. It becomes evident that obese learners are viewed as learners at risk due to their body composition.

WHO (2015) estimates a 33% rise in deaths from chronic diseases and 45% from cancer by the year 2025 in Tanzania. Diseases which are indicative of obesity and overweight include heart diseases, diabetes, cirrhosis of the liver, chronic diseases, artery diseases, gall stones, cancer and digestive system diseases (Insel & Roth, 2002). The general level of prevalence of obesity in Tanzania is higher for females compared to males. The perceptions about body size and body image are determined by factors of culture and ethnicity (Ahmed, Rwabilimbo, Abrha, Page, Arora, Tadese et al., 2020). Individuals with obesity are believed to be at the greatest risk of contracting diseases such as increased risk of NCDs such as Type 2 diabetes mellitus, cardiovascular and respiratory diseases (Ahmed, Rwabilimbo, Abrha, Page, Arora, Tadese et al., 2020).

This results from the common perception of the desirability of obesity as well as a lack of knowledge of its detrimental effects on learning. For this reason, wealthier households are at greatest risk (Reilly, 2005). It should be emphasised that poorer learners are also at risk. It is not just education or income that determine the risk but there is a plethora of risk factors which are involved in the process, and which might change over time (Monteiro et al., 2004). A study in Nigeria, focusing on nicknames and factors regarding the emergence of the trend, found out that 26.7% of adolescent learners obtained their nicknames based on physical appearance, and body weight (Kolawole, Otuyemi & Adeosun, 2009).

This trend may have an influence on the learners' self-esteem, resulting in poor academic performance. One of the studies (Mathew, 2022) suggests that African cultures emphasise physical appearance to the extent that children as well as adolescents struggle to meet or achieve the "societal ideal" figure. The onset of obesity was apparent among middle-aged, urban residents and adults in modern economies, but now extends to semi-urban, rural and young people in developing nations (Mtumwa, Paul & Vuai, 2016; Wang & Lobstein, 2006). Nigeria still battles significant obstacles relating to the prevalence of communicable diseases and under nutrition. However, over nutrition and the associated non-communicable disease present a double burden in Nigeria.

The double challenges are often found to coexist within the same household, thereby forging an intricate situation for policy makers and health care officials to unravel (Kolcic, 2012, Kimani-Murage, 2013). Under- and over-nutrition are best viewed as two forms of malnutrition in Nigeria. The problem of transition in terms of nutrition that learners experience comes as the burden of shifting from one form of malnutrition to another. It is a state of transition from energy deficiency (under-nutrition) to one of excess energy (over-nutrition) (Landgrebe, 2023.) which harbour obesity and its effects on learning. The variation in weight status is observable within households and not just in the wider community.

### **1.3.3 Prevalence of obesity in South Africa**

South Africa is among those countries experiencing an increased transition in the form of demography and nutrition in sub-Saharan Africa. This is related to an increase in obesity and the occurrence of non-communicable diseases (NCDs) such as stroke, heart disease, cancer, and type 2 diabetes (Okeyo, Seekoe, de Villiers, Faber, Nel & Steyn, 2020). The changes might be viewed in the context of the rapid rate of urbanisation and its association with major variations in dietary regimes, adoption of westernised lifestyles and habitual physical activity (Popkin, 2011). Research indicates that once obesity sets in among children, undoing it is a mammoth task (Mbowen & Yongsu, 2019).

Thus, South Africa is no exception to the rapid prevalence of childhood obesity. Literature shows that childhood obesity has been reported to be higher among South African children ranging between 17.1% to 22.8% (Otitoola, Oldewage-Theron, & Egal, 2021). Therefore, obesity as an epidemic cannot be confined to industrialised societies as research even shows that an increase in cases of obesity may be swifter in developing nations compared to the developed world, and South Africa is no exemption (Kantachuvessiri, 2005). Otang - Mbeng, Otunola and Afolayan (2017) report that South Africa will soon experience significant problems with obesity. This is because obesity affects all nations equally irrespective of economic or development status.

The WHO (2019) concur with the South African National Health and Nutrition Examination Survey (SANHANES-2012); Dagne, Gelaw, Abebe & Wassie, (2019); Okeyo, Seekoe, de Villiers, Faber, Nel & Steyn, (2020) that obesity prevalence is at an alarming state among South African adolescents. Obesity as a multivariate syndrome may influence the functioning of the whole body in a negative way (WHO, 2020). In the past decades, obesity was noticeable in developed nations, but has progressively increased in developing states, inclusive of South Africa (Choukem, Tochie, Sibetcheu, Nansseu, Hamilton-Shield, 2020; Villamor, Urassa, Petraro, Hunter & Fawzi, 2014).

Obesity was also regarded as a health condition for adults but is presently prevalent among children from kindergarten to 19 years old (Wang, 2014; Adom, Kengne, De Villiers, & Puoane, 2019). The physical bodily shape of learners in South Africa is heavily influenced by increased fat due to reduced fitness. This condition may be an outcome of a long-term adiposity (Kafyulilo, 2006). The prevalence of obesity in South Africa was notably rising among learners from 2002 to 2008. During this period obesity increased from 6.3% to 11% in males and from 24.3% to 29.0% in females. This obesity prevalence among adolescents is worrying as it increased from 29.3% to 36.5% among school children, which was higher than the global prevalence of 10% and more than half the total obese population in the country (Okeyo, Seekoe, de Villiers, Faber, Nel & Steyn, 2020).

South Africa is ranked among the leading countries in Africa relative to childhood obesity prevalence and predictions are that it will be among the top 20 countries globally in 2025 (Lobstein & Jackson-Leach, 2016; Reddy et al., 2009). Reddy et al. (2012) state that the rate of obesity doubled for both genders, rising from 1.6% to 3.3% for males and from 5.0% to 7.5% for females. Modjadji and Madiba (2019) concur with Puoane, Steyn, Lambert and Mbananga (2012) who report that about 40% of young people in South Africa are obese. South Africa is among those countries experiencing an increased transition in the form of demography and nutrition in sub-Saharan Africa. This is related to an increase in obesity and the occurrence of non-communicable diseases (NCDs) such as stroke, heart disease, cancer and type 2 diabetes (Okeyo, Seekoe, de Villiers, Faber, Nel & Steyn, 2020).

The changes might be viewed in the context of the rapid rate of urbanisation and its association with major variations in dietary regimes, adoption of westernised lifestyles and habitual physical activity (Popkin, 2011). Research indicates that once obesity sets in among children, undoing it is a mammoth task (Mbowen & Yongs, 2019). Thus, South Africa is no exception to the rapid prevalence of childhood obesity. Literature shows that childhood obesity has been reported to be higher among South African children ranging between 17.1% to 22.8% (Otitoola, Oldewage-Theron, & Egal, 2021).

Therefore, obesity as an epidemic cannot be confined to industrialised societies as research even shows that an increase in cases of obesity may be swifter in developing nations compared to the developed world, and South Africa is no exemption (Kantachuversiri, 2005). Otang - Mbeng, Otunola and Afolayan (2017) report that South Africa will soon experience significant problems with obesity. This is because obesity affects all nations equally irrespective of economic or development status. The WHO (2019) concur with the South African National Health and Nutrition Examination Survey (SANHANES-2012); Dagne, Gelaw, Abebe & Wassie, (2019); Okeyo, Seekoe, de Villiers, Faber, Nel & Steyn, (2020) that obesity prevalence is at an alarming state among South African adolescents.

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Modjadji and Madiba (2019) concur with Puoane, Steyn, Lambert and Mbananga (2012) who report that about 40% of young people in South Africa are obese. A noticeable dearth exists regarding statistical information on the prevalence of obesity in Africa. Kamkuemah, Gausi, and Oni, (2022) observes that one of the most rapid increases in obesity is to be found among learners in South Africa. WHO (2015) projected that the prevalence of obesity would have increased by 3% in 2015. The consumption of modern food stuff, the use of new technology, equity and transport system have influenced the rate of growth of obesity from increasing arithmetically but geometrically (WHO, 2005; Pisa, Pisa, Chikandiwa & Chikandiwa, 2021).

Overweight and obese children are likely to maintain their condition into adulthood, which exposes them to momentous problems in relation to personal, academic and social life (Atay & Bereket, 2016; Simmonds et al., 2016; WHO, 2016). Obesity among black females in South Africa is associated with the aesthetic and cultural belief that bigger is better (Okeyo, Seekoe, de Villiers, Faber, Nel & Steyn, 2020); Mvo, Dick & Steyn, 1999). This shows that people lack information about obesity and its effects on learning. South Africa is reported as having the highest rate of obesity in Africa (Muthuri, Francis, Wachira, LeBlanc, Sampson, Onywera, & Tremblay, 2014); and this is comparable to what obtains in the developed nations (Klingberg, Draper, Micklesfield, Benjamin-Neelon, & van Sluijs, 2019). Socio-cultural factors have been identified as influencing beliefs such as the view that “societal thin” versus “societal big” is the preferred body shape.

This may further lead to the development of certain eating disorders (Holland & Tiggemann, 2016) and later poor body dissatisfaction among learners in the 15 to 18 years’ age range (Paolini, 2016; Caradas, Lambert, Charlton, 2009). Poor body image can have deleterious effects on self-esteem and academic outcomes (Diedricks et al., 2015; Shloim, Hetherington, Rudolf, & Feltbower, 2013). Despite major improvements socially and politically in South Africa since the end of apartheid in 1994, the country still exhibits a varied population and culture, as evidenced by the ethnic divisions among groups (Magubane, 1994; Fiske, 2005; Kon & Lackan, 2008; Ayo-Yusuf et al., 2013).

There are differences in the manifestation of obesity among people from various geographic regions and ethnic backgrounds (Rossouw, 2012, Puoane et al., 2002, Kruger et al., 2005). The differences in gender and age are also strong factors in determining the rate of obesity in any area (Choukem, Tochie, Sibetcheu, Nansseu, Hamilton-Shield, 2020). In South African studies, obesity perceptions are related to wealth and power (Draper, Tomaz, Bassett, Harbron, Kruger, Micklesfield, & Lambert, 2019). This implies that the prevalence rate levels remain constant at infancy, but a rebound is triggered at mid or late childhood owing to the adolescence stage.

The occurrence of obesity becomes gender sensitive at this stage with rates commonly higher in females than in males (Modjadji, Masilela, Cele, Mathibe, & Mphekgwana, 2022). This change in body composition brings about obesity and impacts negatively on learner academics. Rossouw (2012) states that there is evidence that both obese and underweight individuals can be found in the household. Literature clarifies that the prevalence of childhood obesity is associated with family background, food intake and energy expenditure, physical inactivity and unhealthy diets.

#### **1.4 STATEMENT OF THE PROBLEM**

Obesity has become an epidemic on the rise and needs urgent attention in South Africa. The problem of overweight children of school-going age has immediate, short and long-term consequences, both physiological, psycho-social as well as cognitive implications. There are dire effects on the lives of obese children in relation to their academic performance.

Perceptions about obesity differ from rural to urban settings. In urban communities, obesity is viewed as a problem as opposed to rural communities. In rural settings, obesity is perceived as a symbol of wealth and a “culturally acceptable ideal body.” A study by Johnson & Johnson, (2015) conducted in rural areas among children aged 2–19 established that 26% of rural obese children have greater odds of obesity compared to children residing in urban areas.

The study further suggests that obesity in rural areas is perceived as an exhibition of wealth and prosperity, signifying an increased access to many of the lifestyle habits of urban residents within some rural areas. However, some studies (Bosire, Cohen, Erzse, Goldstein, Hofman, & Norris, 2020) show that obesity is considered desirable as a symbol of vitality and good health, well-cared for, beauty and absence of illnesses and is associated with wealth, prosperity, affluence, and happiness. The literature reviewed in this study suggests that as obese learners are victimised, bullied, stigmatised, teased, intimidated and marginalised, they develop low self-esteem and psychological stress because of negative comments that teachers and peers make about them (Shrestha, Asthanee, Karmacharya, 2021).

The consequences of this teasing culminate in absenteeism from school which manifests in learners' poor academic performance. This study strives to establish how obesity affects learners in a rural setting, specifically interrogating the ways in which the constructs and experiences of their self-esteem, victimisation, physical inactivity and diets are complicated factors relative to their academic performance. Other rural secondary schools in Mvudi circuit of Vhembe District could be experiencing obesity differently as compared to those in other districts and countries.

### **1.3 AIM OF THE STUDY**

The aim of the study was to assess the impact of obesity on learner academic performance in rural secondary schools in the Mvudi Circuit of Vhembe District, Limpopo Province, South Africa.

### **1.4 OBJECTIVES OF THE STUDY**

The study sought to achieve the following objectives, designed to:

- Identify the causes of obesity among learners in rural secondary schools in Mvudi circuit of Vhembe District.
- Assess the impact of obesity on learners' academic performance in rural secondary schools in the Mvudi circuit of Vhembe District.
- To determine the extent of obesity on learner academic performance in rural secondary schools in Mvudi circuit of Vhembe District.



### **1.4.1 RESEARCH QUESTIONS**

Research questions guide each specific study and are used in the development of instruments that are employed in the generation of data to address the purpose of the study (Creswell 2003:88). The following main research question guided the study:

- What is the impact of obesity on learner academic performance in rural secondary schools in Mvudi circuit of Vhembe District?

### **Sub-Questions**

The research sub-questions were formulated as follows:

- What are the causes of obesity in rural secondary schools in Mvudi circuit of Vhembe District?
- How does obesity exert an impact on learner academic performance in rural secondary schools in Mvudi circuit of Vhembe District?
- To what extent can obesity impact on learner academic performance in rural secondary schools in Mvudi circuit of Vhembe District?

## **1.5 KNOWLEDGE DISSEMINATION**

This study seeks to add to new knowledge on obesity and its impact on academic performance through seminars and presentations with DoE officials, parents and learners, thereby contributing to the community knowledge on lifestyles. Several aspects of the study are also disseminated through publication of the results and findings in accredited peer reviewed journals, local, national and international conferences. I envisage engaging with the local radio stations and social media platforms in disseminating the findings through talk shows, making available the completed thesis to the Vhembe District DoBE office, participating schools and teaching young children about obesity and the effects it has on their lives through motivational speaker's platform.

## **1.6 LIMITATIONS OF THE STUDY**

The study was conducted in predominantly public rural secondary schools in Mvudi circuit of Vhembe district. Data was collected from only five (5) rural secondary schools in the Mvudi circuit of Vhembe district where generalisation cannot be drawn from the research findings, particularly to reflect the status in private secondary school settings. Since the study was limited to learners in public and rural secondary school settings, the participants in this study are from lower-family income classes where the quintile level of the school is determined by the socio-economic status of the family and the education level. Due to the sensitive nature of the topic, some students felt offended when they were identified to contribute to the interview sample. The use of the 5-point Likert scale might have compromised the research findings because some responses were “not sure” at 30% and this is an indeterminate category that complicates the interpretation of such a submission.

## 1.7 STRUCTURE OF THE STUDY

The thesis consists of six (6) chapters:

Chapters	Contents
Chapter 1	This chapter presents an introduction to the study, outlines a statement of the research problem, aim and objectives of the study, research questions, contribution to the body of knowledge, knowledge dissemination, limitations of the study and chapter outline.
Chapter 2	This chapter focuses on literature review, historical background, global trends of obesity, impact, mitigation and consequences of obesity on learner academic performance in rural secondary schools.
Chapter 3	This chapter focuses on the theoretical framework and engages with the theory that underpins this study.
Chapter 4	This chapter covers the research paradigm, research design and methodology. Mixed methods design was used in the triangulation of data. The research design is thoroughly discussed. The research approaches in both the quantitative and qualitative approaches, the population, sampling procedures, sample, data collection procedures and research instruments, data analysis are adequately discussed.
Chapter 5	This chapter focuses on data presentation, interpretation and analysis of the findings.
Chapter 6	This chapter presents the summary, conclusion and recommendations derived from this study. It proffers a model designed to mitigate the negative effects of obesity of the academic performance of learners in Vhembe District and the proposed model.

## **1.8 CHAPTER SUMMARY**

Chapter one provided an overview of the study. The background to the study was presented by contextualising the challenges of obesity and its impact on academic performance within the preliminary literature review that anchored and provided a useful backdrop to the problem thereby justifying the study. The purpose of the study was to assess the impact of obesity on learner academic performance in Mvudi circuit of Vhembe district. This chapter outlined the specific objectives that were used to achieve the aim of the study. Since the study utilises a mixed method approach, there was some justification provided for the use of quantitative and qualitative questions used to address the research problem. The next chapter focuses on literature review, historical background, global trends of obesity, impact, mitigation and consequences of obesity on learner academic performance in rural secondary schools.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

The chapter reviews literature on the impact of obesity on the academic performance of learners with this condition in rural secondary schools. The chapter begins by defining the concept of obesity as used in the study. This is followed by a discussion on the prevalence of obesity and its global trends, the African trend and obesity in South Africa. The literature review continues to discuss causes and effects of obesity on learner academic performance.

The review of literature is guided by the following research objectives, designed to:

- Identify the causes of obesity among learners in rural secondary schools in Mvudi circuit of Vhembe District.
- Determine the effects of obesity on learner academic performance in rural secondary schools in Mvudi circuit of Vhembe District.
- Explore the perceptions of learners on obesity in relation to academic performance in rural secondary schools in Mvudi circuit of Vhembe District.

#### **2.2 CAUSES OF OBESITY AMONG SCHOOL LEARNERS**

There are various causes of obesity among learners as established by several researchers. These include physical inactivity, poor nutrition as well as medications, endowments and financial situations (O'dea, 2003).

##### **2.2.1 Psychological causes**

The World Health Organisation (2020) declared COVID-19 a pandemic in March 2020. This caused the state and all local governments to enact many regulations restricting the movement of people and physical interactions. Primary and secondary schools closed throughout the country, with some schools extending business closures until the end of the 2019-2020 calendar year (UNESCO, 2020).

COVID-19 had far-reaching social, psychological, health and academic implications emanating from such incidents as the abrupt cessation of school programmes that worsened the predisposition to obesity in childhood (Rundle, Park, Herbstman, Kinsey & Wang, 2020). The imposed lockdowns and school closures made children stay at home because many households stocked up on ultra-processed and high energy foods (Creswell, 2020) and the school-going children had little if any physical activity to undertake. This lockdown had the effect of impacting negatively on the academic performance of learners. The unexpected closure of schools caused untold hardships for students, teachers and all education stakeholders as academic performance and interest of students was affected negatively due to unproductive students' engagement leading to demotivation in learning and deficiencies in academic achievement (Onyeama, Nwafor, Obafemi, Shuvro, Atonye, Sharma, & Alsayed, 2020).

COVID-19 had far reaching academic, social, psychological, physical / health and economic implications such as abrupt cessation of school programmes that literally exacerbated the epidemic of childhood obesity (Rundle, Park, Herbstman, Kinsey & Wang, 2020). As many countries imposed lockdowns, children stayed home and engaged in binge eating which escalated the obesity epidemic as the learners were less motivated to read and engage with school books which negatively impacted on learners' academics. Consequently, quarantine - related stress and depression led to an increase in the intake of sugary, fatty junk food stuffs such as chocolate and soft drinks (Yılmaz & Gökmen, 2020; Banik et al., 2020); eat more unhealthy food, have much longer screen time, and have irregular sleep patterns; (Rundle et al., 2020); easily causing weight gain linked to obesity (Campana et al., 2019; Fonseca et al., 2018), reduced physical activity due to school closures, (Mediouni et al., 2020a) led to an increase in obesity and a reduction in energy expenditure elastifying increase to a risky vicious cycle of obesity and condensed energy spending (Sharafi et al., 2020). Lengthy TV watching is linked with an increase in ingesting of fast food and energy-dense snacks (Shqair, Pauli, Costa, Cenci, & Goettems, 2019).

Such people increase their intake of these food stuffs to enhance their mood. There is considerable evidence that exposure to TV food promotion significantly influences children's food preferences, choices, purchase requests and food intake (Xian, Zeng, Cai, Xie, Xie, Sharma, & Shi, 2021; Utter, Scragg & Schaaf, 2006). The intake of –calorie-rich, fatty foods and decrease in healthy diets attached with inactivity causes accretion of adipose tissues and progressive rise in obesity, cardiovascular diseases and diabetes that hamper school attendance and lead to low academic attainments as the victims cease attending classes due to ill health (Mandal, 2020) which may negatively impact on their academic performance due to their absenteeism.

The implementation of business lockdown and social distancing meant that learners were deprived of the usual activities' commonplace in schools inclusive of recess, travelling to and from school, and other extra-curricular activities (Dunton, Do & Wang, 2020). This alone seems to have been a massive blow to the learners' psychological, emotional, and physical aspects. Despite these measures being used to slow down the spread of COVID-19, they seriously limited the ability of learners to engage in sufficient levels of physical activity (PA) to maintain healthy bodies and prevent the onset of obesity and its negative academic consequences. This is predicted to cause serious underperformance among obese learners (von Hippel & Workman, 2016).

COVID-19 has been linked to risk of exposure to obesity, limited access to food as school closures meant that learners had no access to school-based nutrition, undernutrition and weight gain, severe amplified food insecurity, intensified reliance on processed food, and reduced opportunities to exercise outside (Rundle, Park, Herbstman, Kinsey & Wang, 2020). In essence the learners engaged in a sedentary lifestyle and changed eating behaviours, and perceptions of food safety that alters cognition. Campbell and Haslam (2005) state that social isolation and withdrawal may result from a distaste of active participation in physical activities. This may lead the learner to develop low self-esteem which may affect their academic performance. Increased weight might result from negative psychological issues or behavioural consequences emanating from the effects of physical home confinement (Wang, Zhang, Zhao, Zhang & Jiang, 2020).

Prolonged home confinement has detrimental psychological and physical effects as learners become physically inactive, have much longer screen time, and indulge in unhealthy emotional eating due to boredom which alter their mental alertness leading to poor academics. Alleyne and LaPoint (2004) mention that it is a common occurrence to have emotional eating habits during stressful life. Emotional eating may also be tied to specific events or periods of stress in the life of an individual such as in cases of COVID 19 where learners are distanced and isolated from their teachers and friends. Such eating disorders cause obesity which later impact on learners' academic performance.

For example, during the Corona virus lockdown students had to stay at home, leading to increased risks of gaining weight, increased intake of unhealthy foods as well as gross inactivity and minimal cognitive stimulation due to school closures (Allabadi, Dabis, Aghabekian, Khader & Khammash, 2020). The child may be overwhelmed, leading to the development of negative health conditions such as bulimia (overeating) and anorexia nervosa (obesity) which affect academic performance. Amjad, Zafar, Maan and Kashif (2018) observe that some children are overweight and obese in contrast to others of their age groups and heights because they regularly consume saturated drinks, eat fried meats, and eat heavy meals that do not digest timely. Soft drinks and fatty junk-food items do not strengthen muscles but contribute towards eating disorders, which cause obesity that later affect learner's academic performance.

Changes in diet due to eating high-caloric food stuffs which are rich in fatty and sugary sweetened beverages cause a decrease in physical activity (Smethers & Rolls, 2018). The shifts in eating habits are usually due to environmental changes, which are evident during lockdowns, curfews, and periods of quarantine that are used to mitigate the effects of COVID 19. The net effect becomes the onset of obesity and lowering of school grades. Learners tend to exhibit some signs of psychological and social distress, like depression and low levels of self-esteem. Several evidence-based studies have shown that obese learners have an increased incidence of poor self-esteem and low academic performance than their non-obese peers (Manyanga, El-Sayed, Doku, Randall, 2014).



### **2.2.2 Physical activity**

Literature by Shantakumar, Sahabdeen, Abidin, Perumal, & Kumar, (2022) confirms that being physically active does not only help to improve the physical health of an individual, but also improves one's academic performance. Low levels or being physically inactive can hamper learners' cognition and cognitive alertness which lead to academic underperformance. Regular activities can also be related to amplifying self-esteem, enhanced classroom participation, and sound student academic performance. Physical activity can be used as an excellent strategy for teachers to model and impart moral values. Seeing their teacher model good behaviour inspires and inaugurates the same behaviour in the children (McBer, 2001).

Teachers model honesty by teaching fair play and good sportsmanship and by respecting all students and treating everyone with compassion, inclusive of the obese learners. The conditions in rural areas have also ceased to be strong barriers to technology as the electronic gadgets have increasingly penetrated those geographic spaces (Kristjansson, Elliott, Bulger, Jones, Taliaferro, & Neal, 2015). The presence of technology has meant that watching TV has become more accessible than participating in active play, leading to an increase in the susceptibility of rural-based learners to obesity (Chi, Luu, Chu, 2017). The prolonged indoor life of children has worsened their levels of overweight and obesity, retarded their cognitive development and subsequently lessened their academic performance (Black, Johnston, & Peeters, 2015).

Low levels of PA (being physically inactive) can lead to poor metabolism, low inclination to participate in physical activities among learners, and ultimately poor performance at school (Sember, Jurak, Kovač, Morrison & Starc, 2020). It has been verified that inactivity culminates in the deterioration of brain structure, cognitive abilities and brain function (Sibley & Etnier, 2003). Campbell and Haslam (2005) observe that there is a significant association between the more time individuals spend watching a television as well as the readily available transport and an increase in obesity. This was also corroborated by findings in a study conducted by Kubayi and Surujlal (2014), who found that obesity was a significant learning problem among those who did little physical activities.

This sedentary behaviour was prominent among learners who have access to technological devices such as TV games, computer games, video games and cellular phones. The current tendency to drive learners to schools has reduced their chances of physical exercise through walking or cycling to and from their institutions. This was confirmed by Lima, Carvalho, de, Nunes, Saraiva & de Souza, (2020) who argue that the conditions of social isolation at home create an ideal condition to engage in online activities and watching television, which however cause individuals to be physically inactive and exacerbate obesity, altering in the process the entire cognitive alertness.

It was established that reduced physical activity among learners is an outcome of factors inclusive of limited physical exercise done within school hours, safety perceptions and use of computerised entertainment. It has been argued, however, that the mere involvement of children in school activities is a public health issue as they learn to adopt healthy lifestyles, which are a prerequisite for academic success (Botchway, Wiafe-Akenteng & Atefoe, 2015). Teachers can use physical activity to help students better their relationships with their peers and to act as role models for good health and moral habits. According to Kubayi and Surujlal (2014), inadequacy in physical activity and health knowledge can lead to obesity and its challenges.

Children who watch television more may probably become eight times overweight compared to their peers who watch less television. Obese children are rarely involved in physical activities and this tends to become a vicious cycle that exacerbates the problem of obesity (Campbell & Haslam 2005). This same study concludes that obese learners are reckless with health issues and perform badly in academics. Physical inactivity and screen time are associated with obesity and overweight among learners (Falbe et al., 2013; Amjad, Zafar, Maan & Kashif, 2018) and have an impact on their academic performance and can lead to increased risk of several serious health conditions such as obesity, diabetes and metabolic syndrome (Dunton, Do & Wang, 2020). Vazquez and Cubbin (2020) note that it is difficult to make children observe the physical activity programmes which may be well laid out.

Children from low status families are worst affected as they usually live in low-income neighbourhoods which are subjected to unsafe spaces for play. Parents might prevent their children from playing in the neighbourhoods due to high crime rates and COVID 19 regulations. They also find it difficult to play with their children and monitor their feeding habits to adhere to the strictures of social distancing.

The higher the intake of food, the higher the need for physical activity to burn down the excess sugar (Obesity focused, 2008). Currently, most people spend a lot of passive time on the television or computer, accumulating excess calories which lead to obesity. Pignone and McPhee (2007) agree that an inactive lifestyle of regular building of excess calories results in obesity. The concept of safety perceptions impresses that it is risky to walk to school, thereby discouraging exercise, endorsing sedentary behaviour and subsequent development of obesity among learners causing them to be reckless with health issues (Ngwu & Ekamen, 2017).

### **2.2.3 Social causes**

Wright (2020) echoes that parents play a crucial role in establishing the eating habits of their children at childhood as these tend to linger on in the life of the person through to maturity. Children with obese parents begin to exhibit an increased preference for high-fat food from 3 years of age. The article on *Causes of Obesity* (2008) concurs that parents exert a deep influence on the dietary regimes of their children from early childhood. The example which parents set for their children regarding shopping, food consumption and physical activity impacts on their energy balance and eventual state of weight. Familial influences are viewed as important contributors to obesity.

It is in this light that Vazquez and Cubbin (2020) assert that the socioeconomic status and the development of childhood obesity are strongly related, meaning that children from rich families tend to be more obese. It is the family which share the level of physical activity, nutritional consumption patterns, habits, attitudes as well as lifestyles which contribute to an individual's obesity history. Campbell and Haslam (2005: 158) state that a shift in the social environment, especially of working parents, influences changes among learners regarding obesity.

There are, however, aspects associated with family life that have disintegrated owing to changes in family structures over time. Families that increasingly experience financial difficulties connected to the lower socioeconomic status may encounter limited opportunities for healthy growth due to inaccessible food choices for healthy living (Vazquez & Cubbin, 2020).

Few reviews, however, provide in-depth discussions concerning the relationship between obesity in childhood and socioeconomic status. Home-cooked meals and snacks constitute an important dietary aspect which mostly has lower levels of fat compared to take-away and fast foods. Chung, Promrat and Wands (2020) observe that abuse, neglect, as well as an unsupportive home environment constitute social aspects which are associated with being obese. Studies show that the frequency of learners that are neglected developing obesity is 9 times higher when compared with that of non-neglected learners. These are learners who find it difficult to cope with school activities resulting in poor academic performance.

Gangela et al., (2020) aver that food provides comfort and serves as a compensatory mechanism for learners who have survived traumatic experiences. Overeating may be an outcome of the environment which exposed learners to conditions of depression, deprivation, familial abuse or somatisation. In addition, Alleyne and LaPoint (2004) posit that the causation of obesity cannot be simply tied down to generic or social factors. It can, indeed, be attributed to a host of intricate interactions between social and generic factors.

#### **2.2.4 Medical causes**

Singhal, Herd, Adab and Pallan (2020) observe that medical or systematic conditions could be the cause of obesity. This cause of obesity appears to be rare in the general population. It is believed that above 90% of obesity in children has an idiopathic cause and less than 10% could be ascribed to endogenous sources. Zametkin et al. (2004) suggests that endogenous sources of child obesity are divided into two groups, that is, genetic syndromes and hormonal causes.

This implies that there is a genetic connection in the development of obesity as it runs in the family. Obese learners with medical conditions may be required to have frequent meals as required by their metabolism, hence exacerbating the problem of obesity, spending most of their school attending time to visit their doctors and medical institutions owing to their absenteeism leading to poor academics. When obese sickly learners go for medical review, they are found to be lagging academically. Obesity – related co- morbidities affect all the aspects of the body altering the physical and psychological alertness of the body which lead to academic incompetence.

### **2.2.5 Culture**

The food which people eat is dependent on the circumstances that are cultural and social within that specific context. Studies confirm the disparities in social groupings regarding the intake of food and nutrients. Unhealthy diets can result in under nutrition (micronutrients deficiency) while healthy eating creates over-nutrition. Obesity affects sections of society in various ways which require essential methods and interventions to remedy (Vazquez & Cubbin 2020; Crichton, Bryan, Murphy & Buckley, 2010). During social gatherings people enjoy eating together as a symbol of friendship and unity without considering the type and quantity of food they eat. The culture of a society shapes the way people choose food and drinks they consume. Habits regarding food intake are culturally defined (Kim et al., 2003). The cultural taboos and preferences influence food consumption patterns and cues of eating.

The influences of culture foster the habitual consumption of food, entailing the preparation as well as the restrictions pertaining inclusion and exclusion of such foods as meat, eggs and milk in the diet. The social constructions on dietary patterns may lead people to abstain from eating nutritious food, leading to improper functioning of mind and physical organs (Harris, Gordon-Larsen, Chantala & Udry, 2006). Indians in America rely a great deal on food from hunting and farming. This kind of food is believed to be a sacred gift from the creator for the Amerindian community (Halpern, 2007).

Currently, in schools and homes the consumed food consists of high fat content, processed foods, salty and sugary and high fructose corn syrup obtainable from convenience stores and fast foods outlet in malls which seem to be preferred and palatable despite the effects they have on the body.

### **2.2.6 Unhealthy dietary behaviours**

Most obese and overweight learners endure the consequences of overeating and inactivity (Bagherniya, Darani, Sharma, Allipour-Birgani, Taghipour & Safarian, 2019). The consumption of food rich in fat and carbohydrates compared to vitamins and protein makes the consumers prone to overweight or obesity, more so, when less energy is expended compared to that which is consumed (Pangrazi, 1995; Wessel & Macintyre, 1997). The obesogenic environment of the COVID-19 pandemic created conditions which are conducive to physical inactivity and sedentary behaviour (Pinto, Dunstan, Owen, Bonfa & Gualano, 2020). Children living under such conditions (lock down/ stay-at-home orders) are likely to be exposed to an elevated risk for energy imbalance and unhealthy weight gain leading to obesity and school non- attendance.

Ammar et al. (2020) confirmed that the quarantine and lockdown restrictions are considered risk factors for the consumption of poor-quality foods, such as ultra-processed foods, lower levels of PA, and unhealthy food that could lead to weight gain. The more time that children spend away from education and associated physical activities, the more they are exposed to the risk of uncontrolled food consumption. Children miss the opportunity to participate in PE classes and other school-based PA activities following the restrictions under lockdown regulations (Guan, Okely, Aguilar-Farias, del Pozo Cruz, Draper, Hamdouchi, et al., 2020; Fawknor, Niven, Hanson, Williamson & Hanson, 2020).

Rundle, Park, Herbstman, Kinsey and Wang (2020) advance the argument that the COVID-19 pandemic could exacerbate the risk factors associated with school lockdown policies by restricting children from attending school which may compromise their academic activities, leading to lower test scores and educational attainment (Psacharopoulos, Patrinos, Collis & Vegas, 2020).

The extended periods of staying at home where food that is ultra-processed and calorie dense expose learners to the risks of obesity. Children are likely to binge eat in the absence of structures guiding when to eat, what to eat and the food size portions (Kinsey & Wang, 2020). The lockdown period, associated with the health pandemic, likewise, affected children with regard to obesity in South Africa. Learners had to eat for leisure and to reduce the stress caused by COVID- 19 mitigation policies that impact on learning because of school closures.

Rundle, et al (2020) observe that for learners in developed and developing countries, the school serves as a place for nutritional support, in addition to the sharing of knowledge and skills. This means that prolonged lockdowns are likely to intensify food consumption as children take on uncontrolled food consumption patterns. The school also helps learners to interact and socialise with fellow classmates, teachers and colleagues. It is a home outside home, with plentiful space to exercise freedom and mingle with individuals that are significant to their growth. Lock down causes students to slacken in getting any instruction and lose significantly as the education sector experiences this paradigm shift into ZOOM learning, digital platform learning or e-learning platforms (Mulenga & Marban, 2020).

According to Van Lancker and Parolin (2020), the school offers psychological solace besides providing pedagogy. It edifies learners through enhancing personal hygiene, healthy eating patterns and body habits (Blair, MacGregor & Lee, 2020). As South Africa is no exception, exposure to obesity among children is also exacerbated during lockdown associated with a pandemic as observed in the real world. Learners tend to eat for leisure and to reduce stress caused by COVID-19. School closures were a response to policies that were aimed at mitigating the impact of the novel disease. Schools were closed to observe social distancing and this avoided physical contact with teachers. Therefore, the participation of learners in physical activities was compromised, a situation that increased the risk of longer-term sedentary behaviours (Ammar, Brach, Trabelsi, Chtourou, Boukhris, Masmoudi, & Müller, 2020).

COVID-19 pandemic Alert level 5 and 4 lockdown restrictions compelled people to panic buy and learners were engaged in impulsive eating disorders which resulted in change in diet and stress or anxiety level (Sasaki, Howe, John, Hickey, Steeves & Conger, et al.,2016). When children have no physical exercise except binge-eating, and they do not attend school, these circumstances could lead them to forget about schooling and this may result in poor academic performance.

### **2.2.7 Family socio-economic status**

Parents exert massive influence on the eating habits of their children since they are the ones that purchase food in the household (Wright, 2020). Learners get accustomed to the food which parents purchase for consumption at home. The availability of unhealthy foods such as candy, sugary sweets, and cookies makes learners to be acquainted with such food types, but stocks of fruits and vegetables equally sways them to those choices. Vazquez and Cubbin (2020) believe that households in low socioeconomic groups are characterised with stocks devoid of vegetables and fruits, respond to adverts of unhealthy foods and have easy access to fast food restaurants. Parents in these groups tend to choose energy dense foods with low value of nutrition as they believe that this kind of food will sustain their children up to the next meal. The parents who are accustomed to eating unhealthy foods imparts such preferences to their children. Children from better families who command wealth are prone to consume fatty junk food influenced by affluence which cause obesity. Such children are fond of eating out in fast food restaurants.

### **2.2.8 COVID – 19 pandemic**

The Coronavirus Disease 2019 (COVID-19) led to an unprecedented health crisis worldwide. The social isolation and lockdown regulations meant that learners had to stay at home, without involvement in schooling while others proceeded learning through virtual platforms. The incessant eating which ensured in most families fostered the development of obesity. The worrying evidence of an association between obesity and increased intensity of the effects of COVID-19 reflects the vulnerability of obese children. Several risk factors of severe COVID-19 include age, cardiomyopathy, and obesity related complications such as type 2 diabetes and hypertension (Shi, Yu, Zhao, Wang, Zhao & Sheng, 2020).



Lighter, Phillips, Hochman, et al. (2020); conducted few studies that included information regarding the BMI of patients with COVID-19, which suggest a high prevalence of obesity in patients with severe COVID-19. Simonnet, Chetboun, Poissy, et al.,(2020) further reveal a risk factor for ICU admission among obese patients with COVID-19. As obese learners are sick and hospitalised, they can't read and do their schoolwork hence it hampers their academics as they ultimately underperform. The COVID-19 health pandemic has high chances to expose learners to the risk of childhood obesity (Pietrobelli, Pecoraro, Ferruzzi, Heo, et al. 2020; Rundle, Park, Herbstman, Kinsey & Wang, 2020).

Obesity is linked to a lot of short term and long-term illnesses. In March 2020, 85 of the 357 patients who were hospitalized with severe COVID-19 at a hospital in France, were found to be obese (Simonnet, Chetboun, Poissy, et al., 2020). The implication is that obesity increases the incidences of COVID-19. Therefore, learners that test positive to the disease must be quarantined or isolated which further leads to depression and anxiety. According to Puga et al., (2020), schools play a crucial role in preventing obesity among learners as these institutions have replaced the traditional roles of families in nurturing children, inclusive of imparting knowledge on health living, healthy eating habits and wellness.

## **2.3 EFFECTS OF OBESITY ON LEARNER ACADEMIC PERFORMANCE**

This section discussed the literature on the effects of childhood obesity. The focus was on its capacity to alter learners' intellectual, physical health, psycho - social, psycho – emotional well-being, economic and self- esteem.

### **2.3.1 Physical Health and Medical effects**

A high BMI at childhood might create adverse effects on the physical health of individuals (Nathan & Moran, 2008; Reilly & Kelly, 2011). This is perceived to impact on learner academic performance which comes as a result of school absenteeism. Learners miss school because they have to go for medical checkup owing to ill health.

The obesity of children is of concern as it has the potential to trigger cognitive, psychological, socio-emotional and physiological consequences. Childhood obesity creates the risk for adulthood obesity (Zaepfel, Bjornstad, & Nadeau, 2014). Juvenile obesity which occurs at an early stage in life has the tendency to affect most organs in the body. It is also associated with morbidity in adolescence and chronic diseases such as hypertension, /levels of cholesterol cardiovascular diseases (CVD)/coronary artery disease, cancer and impaired insulin sensitivity (Danasekaran & Ranganathan, 2019). This type of obesity, with its associated health problems hinders learners from attending schooling and achieving better academic performance. Childhood obesity is also linked with type 2 diabetes, asthma, menstrual abnormalities and orthopaedic problems, hypertension, and hyperlipidaemia (McMullan, Millar & Woodside, 2020).

It is further associated with sleep apnea, stroke, osteoarthritis and certain types of cancer (Kumar & Kelly, 2017; Niehoff, 2009). Obese children run the risk of acquiring problems of breathing difficulties, experiencing fractures and even death (WHO 2018). Obesity has the potential to impede educational performance through poor health. This subsequently leads to decreased participation in class activities and poor academic performance (Wu, Chen, Yang, Li, 2017; Ding, Weili, Steven, Lehrer, Rosenquist and Audrain-McGovern, 2009. Obesity is a source of a host of problems which may be physical, cognitive, emotional, psychological, and health related issues such as hyperactivity disorders and depression (McMullan, Millar & Woodside, 2020; Dunton, Yang, Zink, Dzubur & Belcher, 2019).

Obesity is also viewed as the physical aspect of the body which carries a characteristic that is sanctioned by society (Saguy, 2013). Child obesity has been reported as one of the most stigmatising and least socially acceptable conditions. It has the power to modify the academic performance of learners using social routes such as stigma and discrimination (Katiso, Kerbo & Dake, 2020). Increased weight attracts teasing. This may occur in the form of jokes, being made fun of or through name calling and discrimination. This is attested to by Redondo-Flórez, Ramos-Campo and Clemente-Suárez (2021), who observe that obese children suffer from depression and anxiety due to teasing and bullying, which result in poor academic performance.

Children that are obese are not preferred for friendships (Patel & Holub, 2012). They suffer from peer rejection in society, victimisation, academic underperformance, and depression (Kenney, Gortmaker, Davison, & Bryn Austin, 2015; Greenleaf, Petrie & Martin, 2014; Puhl & King, 2013). Besides stigmatisation, children who are obese experience reduced rates of participation in activities which are physical and have prolonged sedentary life. This may further impact on memory functions of the brain and cognition (Pontifex & Hillman 2008; Castelli et al. 2007).

The status of obesity may also indicate indiscipline at home, which has also been observed to be critical regarding academic success (Sirikulchayanonta et al. 2011). Peers exert a huge influence when it comes to learner academic outcomes (Lavy & Schlosser 2011; Hoxby 2000). Interactions among learners might produce a primary mechanism through which the status of obesity impacts academic attainment (Asirvatham, Thomsen & Nayga, 2019). In essence, obesity influence academic outcomes in a negative way through social, psychological and factors of behaviour (Falkner et al., 2001). Reilly and Kelly (2011) conducted a systematic review pertaining to the effect of obesity on the health of an individual. It was established that childhood obesity heightens the risk of diabetes, premature death, hypertension, asthma, stroke, and the disease of the ovaries. The development of diseases occurs in adulthood (Kelsey, Zaepfel, Bjornstad, & Nadeau, 2014).

Sahoo, Sahoo, Choudhury, Sofi, Kumar, & Bhadoria, (2015) posit that above 60% of children and adolescents that are obese encounter the challenges resulting from high blood pressure, high cholesterol and type 2 diabetes. Obese children are highly likely to report discrimination and experience low self-esteem (Cheng, Zhang, Su, & Kim, 2020). Most health conditions which were previously associated with old age are currently prevalent among children who are obese (Guan, Okely, Aguilar-Farias, del Pozo Cruz, Draper, Hamdouchi, et al., 2020) and impair the academic attainments of these obese learners. A large-scale study carried out in countries in Europe with 26,008 learners showed that approximately 50% of children that are either obese or severely obese suffer from at least one of the following: high blood pressure, suspicion of diabetes, cardiovascular disease, high or low-density lipoprotein cholesterol, high dyslipidaemia, impaired glucose tolerance and high triglycerides (Marlow, Rowe, Anderson, Wynne, King, Howley, & Smart, 2019).

This study was however, based on a biased sample of learners that had transferred to access treatment to remedy unhealthy weight and the data gathering was not population-based. According to Rizk and Yousef (2012), children that participated in this study were very much prone to the health risks associated with obesity.

Kang et al. (2012) confirmed that learners with obesity have a lower minimum oxygen saturation and apnoea–hypopnea index and a statistically higher obstructive apnoea index than learners with a normal weight and those underweight. Increased weight of the body of learners is associated with a lowering of lung volume measurements. This may result in the impairment in the functioning of the lung (Davidson et al., 2014). Obese learners frequently visit doctor regarding lower extremity problems compared to learners with normal-weight (McMullan, Millar & Woodside, 2020; Krul et al., 2009). Such problems can hinder obese learners to attend schooling and adversely lead to poor academic performance.

Studies indicate that 38 out of 39 learners with severe obesity have had at least one marked knee problem (Widhalm et al., 2014), were more likely to have poor academic performance due to absenteeism to consult with their family physician. Of the worst cases, persistent health conditions may even cause premature death among obese learners (Chung et al., 2020). In addition to the above factors, school performance is impacted as obese students experience low school attendance, more detentions, tardiness to school, and reduced participation in school athletics teams (Rajagopal, Briggs & Omar, 2017).

### **2.3.2 Psychosocial effects**

It is well documented that a relationship exists between problems that are psychosocial and obesity (Williams et al., 2013). Research has established major psychological effects of obesity even though it has frequently been treated as a medical issue which is physiological. It is not easy to establish a causal relationship between obesity and psychological issues. The dilemma involves establishing whether obesity leads to psychological issues, or that psychological issues raise the risk of obesity or further still, whether a possible bi-directional relationship exists between obesity and psychological issues.

The most reported psychological factors linked to obesity were subjected to a review study. They were identified as anxiety, depression, body satisfaction, low self-esteem, low self-image, dietary restraint, emotional problems, loneliness, isolation and eating disorder symptoms (Puhl, & Lessard, 2020; Russell-Mayhew, 2012; Figaji & Phillips, 2010). Obesity in childhood is regarded as a huge threat to the society because of its extensive prevalence and its ability to explain the existence of many psychological consequences inclusive of lower self-esteem, discrimination, rejection by peers, depression, impaired quality life, body image disturbance, bullying and stigmatisation (De Niet & Naiman, 2011).

Ganger et al. (2020) states that obesity is also associated with earlier social difficulties of childhood, which includes not being liked by peers. Learners with obesity have a high risk of being teased and bullied (Singhal, Herd, Adab & Pallan, 2020; Rajagopal, Megan; Briggs & Omar, 2017). Jansen et al. (2014) conducted a study and established that any point of increase in the BMI of a learner is associated with a related rise of 0.05 on a standard teacher-reported score of victimisations. It was revealed that learners with obesity are at a high risk of being exposed to bullying, being made fun of or being teased in a hurtful way because of physical differences than those with normal weight and low cognition resulting in poor academic achievement (Hendricks, & Tanga, 2019; Puhl, Pont, et al., 2017).

Obesity bullying can result in negative academic, physical, social, emotional and psychological consequences for the children who bully, the children who are bullied and the witnesses of violence for both learners in urban and rural school settings (Darney, Howcroft & Stroud, 2013). The risk of being bullied increases with an increase in the weight of learners due to emotional comforting eating syndrome. Adolescents with obesity who are teased by their mates' experience feelings of self-worthlessness and low self-esteem (Swan, 2012; Datar, Sturm & Magnabosco, 2014; Alleyne & Lapoint, 2008). It is critical for learners to understand the socio-cultural implications of obesity as it is a continuous concern. Learners who are obese experience challenges related to failure to socialise with their peers due to social marginalisation, teasing and bullying that negatively affect learning (Puga et al., 2020).

They may be afraid of peers who victimise, stigmatise, bully, laugh or mock their size (Pont, Puhl & Cook, 2017; Boyington et al., 2008). The effects of these problems are more with girls than boys (Harriger & Thompson, 2012). This calls for the need for individuals to understand the importance of factors of the environment regarding the level of obesity in learners. Obese learners internalise problems in the form of sadness, acting withdrawal and low self-esteem; externalising problems such as fighting, arguing and disobedience; and school discipline problems such as detentions and suspensions (Datar & Sturm, 2004; Shore, Sachs, Lidicker, Brett, Wright & Libonati, 2008), with the presence of these behavioural problems ballooning in a significant manner with increased weight status (Young-Hyman, Schlundt, Herman-Wenderoth & Bozylinski, 2003).

Learners with severe obesity are at a higher risk of bullying compared with other normal-weight learners (Farrant et al., 2013; Qiao-Zhi et al., 2010). They have low self-esteem related to depression and suicide (Choo, Harris, Chew & Ho, 2017) substance abuse, antisocial behaviour, lower acceptance rate by peers which affect academic achievement (Bos, Muris, Mulken & Schaalma, 2006). Children are bound to miss out on interacting with their own peer groups and teachers because of social isolation, physical distance and loneliness. This leads to drastic behavioural problems and school absences in both urban and rural school settings (Gangela, et al., 2020).

Puhl, Luedicke and Heuer (2011) concur with Álvarez-García, Núñez, Pérez-Fuentes, & Núñez, (2020) that obesity is the primary reason for the victimisation and teasing of learners during activities as well as eating in the school cafeteria as such obese learners also run the risk of being excluded from activities that are social in nature. Fonseca et al. (2009) argue that obese learners are highly likely to present themselves as unhappy owing to negative attitudes which they harbour regarding their physical looks and are prone to rejection from peers. Obese learners face discrimination, rejection and fall victims of aggression and bullying in many areas of their lives which hamper their academic achievement (Álvarez-García, Núñez, Pérez-Fuentes, & Núñez, 2020).

This includes weight-bias and stereotyping by peers, educators and even parents (Puhl & Latner, 2007). Children with obesity often experience high levels of social exclusion and attribute their weight as the reason for this exclusion and for having few friends (Kimm & Obarzanek, 2002). In addition, obese young people rate their academic performance lower than their non-obese peers (Mellin, Neumark-Sztainer, Story, Ireland, & Resnick, 2002) due to self-fulfilling prophecy. Some researchers suggest that attributes of teachers may play a role in poor academic achievement as one study found that the more obese a girl was, the less intellectually capable her teacher rated her (Smith & Niemi, 2003). School teachers may discriminate against learners that are obese, grouping them in a way that is harsh despite of real academic performance.

The grade of learners may be affected indirectly because of teachers' lower expectations of obese learners (Pit-ten Cate, & Glock, 2019). Learners with obesity underperform in class because of internalisation of lower expectations by teachers (Kuklinski & Weinstein 2001). Wilson, Smith, and Wildman, (2015) established that school staff and teachers expect learners with obesity to be less tidy, more irrational, as well as less likely to do well at school compared to their peers who are normal. Sawhney (2020) concur with Puhl and Latner, (2007) who revealed that young learners with obesity as early as three years of age, assign negative traits, adjectives such as lazy, stupid, dumb, ugly, sloppy, having less friends and mean to a figure of an obese learner. Obesity in children impacts significantly on the emotional growth of the adolescent or child that suffers stigmatisation and discrimination (Ariaratnam, Hasani, Krishnapillai, Abd Hamid, Jane Ling, Ho, et al. 2020).

Learners with obesity tend to be associated with greedy and glutton, negative characteristics, ill-disciplined and weak minded and are more likely to develop a poor working memory, which might be closely related to adverse academic outcomes (Wu, Chen, Yang, & Li, 2017). Other children unfortunately and uniformly rank learners with obesity as the least required friends (Belsky, 2016; Farrant et al., 2013). This adverse stereotyping facilitates poor mental health, which can impede academic performance, causing restricted future employment opportunities (McMullan, Millar and Woodside, 2020).

Bacchini, Licenziati, Garrasi, Corciulo, Driul, Tanas, and Valerio (2015) found obesity to be associated with bullying behaviours, victimisation and perpetration as early as age 11. Belsky (2016) confirms that teachers tease obese learners and cause them painful experiences which can even result in psychologically traumatic experiences. Social stigma and the mental health consequences associated with obesity in childhood are also important as they impair academic performance (Doi, Barendregt, & Onitilo, 2013). McMullan, Millar and Woodside (2020) note that obesity might affect children in terms of social and emotional health as they experience social marginalisation and negative prejudice. Farhat (2016) reveals that victim of weight-based teasing reported attempting suicide and engaging in risk behaviours and have reinforced poor body image.

The stigma that overweight and obese children experience often results in increased risk of depression, poor academic performance, psychosocial difficulties, suicidal ideation, and exacerbation of their weight status (Olsen, Ritchey, Mesnard & Nabors, 2020). Jansen, Verlinden, Dommissie van Berkel, Mieloo and Raat (2014) concur that being victimised contribute to peer rejection, stigmatisation and academic failure. Learners with obesity have a negative body image compared to their age mates and more frequently believe that they are responsible for their state of obesity. Adults stigmatise children with obesity on the pretext that they lack self-control and are untidy (Backstrom, 2019; Zametkin, Zoon, Klein & Munson, 2004).

Such obese children tend to show lower social attainment and academic performance and are likely to experience a high risk of mental health consequences such as depression and anxiety, increased alcohol and drug use, smoking and low academic achievements (Haegele, Aigner, & Healy, 2020). Therefore, obesity is likely to affect the health of children in the form of social, physical and mental well-being. Children that are obese show lower self-esteem, which is significant to cause loneliness, sadness, high risk behaviour such as alcohol consumption and smoking (Gangela et al., 2020). A meta-analysis research that examined the existence of an association between health-related quality life and BMI established that learners with obesity have a highly reduced psychological and physical quality of life that is health related (UI-Haq et al., 2013).



### **2.3.3 Socio-economic effects of childhood obesity**

Childhood obesity is considered a crucial risk factor for many cardiometabolic disease endpoints (Gangela, et al, 2020). Obesity leads to indirect costs due to an increase in the risk of mortality, loss of academic productivity and premature deaths (Wang et al., 2011, Gangel et al. 2020). Intangible costs of obesity have an association with quality of life (Ariaratnam, Hasani, Krishnapillai, Abd Hamid, Jane Ling, Ho, et al. 2020). In a study to assess the quality of life as related to health among learners in ten countries in Europe, inclusive of France, United Kingdom, Czech Republic, Germany, Hungary, Poland, Austria, Spain, Netherlands, and Switzerland, it was established that those with obesity have a lesser mean of quality of life scores compared to those of non-obese learners (Ottova et al., 2012).

When these obese learners suffer from ill-health, effective learning cannot take place in an unhealthy body where the quality of life is compromised. Instead, the sickly learner can be absent from school due to ill-health and attending check-ups. All this absence compels the learner to lose academic time which can result in the learners' poor academic performance. Obesity affects the whole body, as it is believed that learning can only take place in a healthy body, learners with ill-health can experience poor academic achievements. In the same breath, normal-weight learners have a significantly higher quality of life scores regarding physical functioning than obese learners. In many studies, obese adolescents report lower general health scores (Friedlander, Larkin, Rosen, Palermo, 2003; Swollen, Reither, Haas & Meier, 2005); lower health-related quality of life (Schwimmer, Burwinkl & Varni, 2003) and higher rates of comorbid conditions (Halfon et al, 2013).

Adolescents and children experiencing a high body mass index (BMI) record greater emergency room and outpatient visits as well as increased cost of health care compared to those of normal weight (Hampl, Carroll, Simon & Sharma, 2007; Trasande & Chatterjee, 2009). This implies that the adverse effects of obesity not only have the potential to increase costs of health care, but also the increased usage of health care services might compel absence from school to address health issues. Consequently, this may affect academic achievement during obese teenage years.

Obesity and poor physical health have adverse academic consequences which result in grade retention, poor academic outcomes, absenteeism and health and psycho-social school problems.

#### **2.3.4 Socio-emotional effects**

Childhood obesity affects children's social and emotional health. Obesity has been confirmed to cause stigmatisation as well as the least acceptable social conditions in childhood (Schwimmer, Burwinkle & Varni, 2003). Learners with obesity are frequently bullied and teased because of their weight. Such children encounter a host of other setbacks inclusive of discrimination, negative stereotypes and social marginalisation (American Academy of Paediatrics, 2014). The discrimination of individuals with obesity is found to exist even among 2-year-old children (Fidler Mis, Braegger, Bronsky, Campoy, Domellöf, Embleton, & Fewtrell, 2017). Learners with obesity are frequently excluded from competitive activities, especially those that need physical participation. As a result, such learners can obtain very low marks that can lead to poor academic performance (Taras & Potts-Datema, 2005).

Social problems associated with obesity such as negative body image, low self-confidence and low self-esteem impede individuals from leading a normal life (Ariaratnam, Hasani, Krishnapillai, Abd Hamid, Jane Ling, Ho, et al. 2020) and can also hinder academic performance (American Academy of Paediatrics, 2014). If learners participate in groups for marks at school, obese learners are invariably discriminated and excluded. Studies show that socio economic status, obesity, poor nutrition, and food insufficiency affect a child's school achievement. Obese learners are at nutritional risk and have lower mathematics scores, poorer attendance, and more behavioural problems (Taras & Potts-Datema, 2005). Obesity-based discrimination is harmful to its victims and can have enduring effects such as school dropout and poor academic attainments.

Obese learners are excluded from group activities especially when it entails grading as they are perceived as floppy, less able and lazy. Obesity is socially associated with disability and vulnerability and even hampers social integration (Lachal, Orri, Speranza, Falissard, Lefevre, Qualigramh & Revah-Levy, 2013).

This suggest that obese learners are then excluded from mixing with others as they are perceived as people with disabilities who cannot participate fully. It is possible that group members would not like to have differently abled obese individuals in their groups as that may cause the group to obtain low marks. The general impression is that obese learners cannot perform due to the body mass. Children that are obese may also have trouble in managing their health. They tend to safeguard themselves from negative attitudes and comments through retreating to safe places, for example their homes (Puolakka, Pahkala, Laitinen, Magnussen, Hutri-Kähönen et al. 2020). Retreating to the home environment can cost learners in the form of poor school attendance which may lead to academic failure. Similarly, obese learners tend to develop a limited number of friends compared to their normal weight counterparts. This in turn creates reduced play and social interaction, with plenty of time being expended on sedentary activities (Sogari, Velez-Argumedo, Gómez, & Mora, 2018; Niehoff, 2009).

### **2.3.5 Effects of obesity on learner academics**

Obesity affects a child's scholastic experience. Obese learners have 36% more absences from school due to illness than their peers of normal weight (An, Yan, Shi, & Yang, 2017; Pan, Sherry, Park & Blanck, 2013). Being absent from school negatively affects academic performance as learners miss out on the content taught during their absence. Obesity that develops at childhood has the effect of negatively impeding academic performance. It is evident that there are many problems related to schooling that are faced by obese learners. In education, the performance of learners is considered an indicator of the quality of human resources. This is, however, influenced by external and internal factors associated with the physical conditions in the learning environment (Sanya, Budi & Faisal, 2019).

The negative medical states of learners impede their cognitive acumen such that they cannot fully remember the content of study (Syah, 2014). It is therefore important for students to eat healthy and nutritious food to stay healthy and focused on the classroom. Obese children are more likely to repeat a grade in school compared with their normal weight counterparts (Halfon, Larson & Slusser, 2013;

Thompson, Hong, Lee, Prys, Morgan, & Udo-Inyang, 2020) as they experience frequent absence from school compared to their counterparts of normal weight (Carrello, Lung, Killedar, Baur, & Hayes, 2021; Halfon et al, 2013). Inadequate school achievement is evidence that learners have failed to master the social as well as educational competencies which are required of them on completion of a given level of grade as success in every educational institution is measured by the academic performance of the students (Ushie, Emeka, Ononga, & Owolabi, 2012). Obese adolescents in the highest weight bracket tend to have increased rates of school absence (An, Yan, Shi, & Yang, 2017; Li, Raychowdhury, Tedders, Lyn, Lopez-De & Zhang, 2012).

Overall school engagement is lower in obese learners as well (Bethell et al., 2010); and academic effort decreases significantly as weight status increases (Ramaswamy, Mirochna & Perlmutter, 2010). They are likely to be absent from school frequently due to their obesity related chronic health conditions such as diabetes and asthma which in turn affect their academic performance. A relationship exists between BMI and academic performance. The BMI is useful in defining obesity and reflecting indicators of academic performance such as attendance, behaviour, physical fitness of learners (Shore, Sachs, Lidicker, Brett & Wright, 2008). Obesity is linked to lower levels of academic performance (Taras, Potts-Datema, 2005; Wu, Chen, Yang, & Li, 2017). One significant study shows that obese learners show a lower percentile of reading scores compared to non- obese peers (Dian, & Triventi, 2021; Futoshi, 2009).

The types of food that children eat have a direct effect on school performance (Purtell, & Gershoff, 2015); as fast. Fast foods have the capacity to affect academic performance as demonstrated in a study by Kim, Sim, Park, Kong, Kim, & Choi, (2016). Learners that usually suffer from brain fog tend to be those who are bent on eating foods which are rich in fat and sugar content (Afzal & Gortmaker, 2015). The National School Nutrition Programme also have broadly increased educational attainment by inducing children to attend school (Hinrichs, 2010). Boys with obesity possess reduced poorer motor skills and worse motor precision in contrast to boys of normal weight (Lopes, Stodden, & Rodrigues, 2013); and obese girls usually encounter difficulty in concentration compared to girls of normal weight.

A study of children from kindergarten to third grade showed a decline in the academic performance of girls is due to weight gain over time (Manes, 2015). Boys that are obese have the tendency to absent themselves from school compared to their less obese peers, which has a negative influence on their school achievement (Wängqvist & Frisé, 2013). Datar, Sturm, and Magnabosco (2013) indicate that obese children in kindergarten reflect lower scores in mathematics and reading tests compared to those of normal weight. Falkner et al. (2006) report that obese girls are likely to be held back by a grade or so compared to normal-weight girls. Obese learners have various ways of coping with this epidemic, inclusive of engaging in disruptive practices, being withdrawn or shy, creating a barrier for easy interaction with learners and teachers (Puolakka, Pakkala, Laitinen, Magnussen, Hutri-Kähönen et al. 2020).

Childhood obesity is evidenced through low self-esteem and a reduced interest in schoolwork, and these symptoms impair the academic performance of learners. In addition, obese learners show high affinity for victimization and dropping out of school because of being ridiculed by their peers for the overweight status (Gardella, Fisher, Teurbe-Tolon, Ketner, & Nation, 2020). This trend is more pronounced in girls than in boys. The interest of pursuing school is eventually diminished among learners with obesity (Paxton et. al., 2005). Participation of children in physical activities enhances their academic performance (Gangela et al., 2020). Spruijt-Metz and Pentz (2012) contend that physically active learners have improved reading and mathematical outcomes because academic engagement is a key predictor of academic achievement (Greenwood, Horton & Utley, 2002).

Lees and Hopkins (2013) show that learners who participate in physical activities lessons increase their focus and alertness than those who do not engage in sporting activities. Physical activity is a therapeutic process for countering depression (Keeley & Fox, 2009). Evidence from literature reveal that participation in physical activity positively influence academic achievement (Donnelly, Hillman, Castelli, Etnier, Lee, Tomporowski, & Szabo-Reed, 2016) and inactivity is evidenced to be associated with poor academic achievement (Haapala, Väistö, Lintu, Westgate, Ekelund, Poikkeus, & Lakka, 2017).

## **2.4 PERCEPTIONS AND EXTENT OF LEARNERS ON OBESITY**

The views of learners in relation to their own weight have been ascertained in different research studies (Abrahamson-Richards, 2014). The basic results substantiate that those who have an accurate perception of their weight are more willing to control it than those who do not (Khambalia, Hardy, & Bauman, 2012). In addition, more of those who seemed to misclassify their weight were males than females (James & Chasens, 2014). Learners who are overweight mostly have a poor perception of their weight hence they are highly at risk of becoming obese in adulthood (Sutin & Terracciano, 2015).

Some overweight learners do not have an accurate picture of their state of obesity (Puolakka, Pahkala, Laitinen, Magnussen, Hutri-Kähönen et al. 2020). In USA, a cross-sectional research investigation that was done by Wang, Liang and Chen (2009) established that a total of 38% of learners were either overweight or obese, however only 27.2% of them believed this. This finding reflects the consensus on the prevalence of obesity among learners which negatively impact on learners' academics. In most cases, learners do not perceive their obesity status because of their cultural beliefs which view big bodies as either a "social deal" or a reflection of the life of affluence of their families. In this case, the learners would not strive to mitigate the negative effects of obesity in schooling, and thus leading to poor academic performance.

It was further ascertained that most female learners were worried about their weight than their male counterparts. This shows that girls are more concerned about their image and that it exerts a great influence upon their socio-emotional standing. This also explains the strong feelings that females attach to incidents of teasing, mockery and stigmatisation and the way in which these cumulatively affect school performance. In a similar investigation that was carried out in the United Kingdom and focusing on participants in the 7 to 9 year-age range, it was discovered that about 45% of learners that participated (N = 399) had a low estimation of their weight. This was so especially with girls, which shows that females have a negative perception about being fluffy and obese (Trainer, Brewis, Williams, & Chavez, 2015).

## 2.5 SUMMARY

This chapter addressed a variety of issues related to the concept of obesity. Obesity was described as the abnormal and excessive accumulation of fat in adipose tissue to the extent that health may be impaired. The body mass index (BMI) serves as the diagnosis of obesity and is considered a replacement of percentage fat mass. Obesity can also be taken as an aspect of the image of the body which is measured based on that which a given society regards as an acceptable body size. It is caused by an imbalance between the intake and expenditure of energy. The prevalence of obesity is linked, among other factors, to deprivation, urbanisation, modernisation, new technologies and the influence of mass media which encourage the consumption of energy-dense foods and reduced physical activity. Obesity is considered to affect individuals across populations from those at kindergarten, through primary and secondary school to adolescents and adults.

There are various causes of obesity which broadly include the psychological factors, physical activity, social causes, medical causes, sedentary lifestyles, culture, unhealthy behaviours, family socio-economic status and the Covid-19 pandemic. The effects of obesity are widespread, touching vast areas of human life. Some of the diseases which are indicative of obesity and overweight include heart diseases, diabetes, cirrhosis of the liver, chronic diseases, artery diseases, gall stones, cancer and digestive system diseases. The obesity of children has the potential to trigger psychological, socio-emotional, and physiological consequences.

Childhood obesity creates the risk for adult obesity. It is also associated with morbidity in adolescence and chronic diseases such as hypertension, cholesterol cardiovascular diseases (CVD) and impaired insulin sensitivity. It is also linked to menstrual abnormalities and orthopaedic problems, hyperlipidaemia, sleep apnea, stroke, osteoarthritis, experiencing fractures and even death. Other significant consequences of obesity are evident in weight-stigma harbours, loss of friendships, peer rejection in society, victimisation, discrimination, academic under performance and depression. Children who are obese experience reduced rates of participation in activities which are physical and have prolonged sedentary life.

This may further impact on memory functions of the brain and cognition and negatively impact on academics. The next chapter deals with the theoretical mooring of the study and methodological issues connected to obesity.



## **CHAPTER 3**

### **THEORETICAL FRAMEWORK**

#### **3.1 INTRODUCTION**

The chapter presents the theoretical framework, the theory that underpins the study, features and systems that impact relations. It further highlights the microsystem with special emphasis on the home and school settings as the two critical institutions where children meet. The chapter also interrogates the three levels comprising the Microsystem, Mesosystem, Macrosystem in a bid to fully contextualise the study before ultimately proffering a conclusion.

#### **3.2 DEFINITION OF THEORETICAL FRAMEWORK**

Grant and Osanloo, (2014: 438) define a theoretical framework as “the ‘blueprint’ or guide for research that provides a common worldview or lens from which to support one’s thinking about the problem and analysis of data. The theoretical framework guides researchers in shaping what constructs were measured and what statistical relationships were considered while clearly explicating in narrative form, the main phenomena to be studied as well as the key factors, constructs or variables and the presumed relations between them. It is like a microscopic lens that researchers use to conduct research. This is the lens through which the researcher interrogates and evaluates the research problem and research questions. It is an idea, philosophy, principles.

A framework is an outline or a structure. Osanloo and Grant (2016) define the theoretical framework as the “blueprint” for the entire dissertation. It serves as the platform and foundation on which to build and support the study and provides the structure in defining how the researcher philosophically, epistemologically, methodologically, and analytically approaches the dissertation. The theoretical framework presents how research is presented, conducted and provides the rationale on how a dissertation strives to investigate a research problem. The researchers’ investigation is provided with the background that offers a thorough explanation of research problem to the reader.

It is an interrelated set of constructs, variables, hypotheses or propositions for measuring the relationships that one seeks to understand. In observation of the above description of a theoretical framework, this research study is underpinned by the Socio Ecological Systems Theory developed by Urie Bronfenbrenner (1979).

### **3.3 THEORETICAL FRAMEWORK**

There are several theories relevant for the prevention of behaviours that generate health risks. The Social Ecological Systems theory which was developed by Bronfenbrenner underpins this current investigation. The theory assists to clarify the forces which influence the health comportment of individuals.

#### **3.3.1 BRONFENBRENNER'S SOCIAL ECOLOGICAL SYSTEMS THEORY**

The Social Ecological Systems Theory underpins the study and was used to assess the impact of obesity on learners' academic performance. This theory examines the child's individual development within the context of the systems of relationships that form the child's environment where bidirectional relationships and influences take place. The teacher and child relations happen inside an ecological situation comprised of a hierarchy of structures, referred to as the Microsystem; Mesosystem, Exosystem, Macrosystem and Chronosystem (Bronfenbrenner, 1979:44).

Rogoff and Angelillo (2003) examined the relationship between the teacher and the child from an ecological framework that involves the physical and social surroundings in which obese children and their teachers are reciprocally engaged. Bronfenbrenner's ecological model organises contexts of development into five levels of external influence. These levels are categorised from the most intimate level to the broadest.

These systems form a group of connected settings which originate within the diverse settings. There are systems that are connected which contain the social and cultural frameworks that encompass the child's environment. The use of the Social Ecological Systems theory as scheme for studying the relationship between teachers and child development is important in strengthening the relationship in the Microsystem, Mesosystem and Exosystem (Benjamin, 2015).

Connections between teachers and learners can be affected by the teacher's / student relationships, characteristics of children's body structure as obesity, health risks associated with obesity, socioeconomic status, eating behaviour, sedentary lifestyle and culture.

### **3.4 Features and systems impacting relations among peers, teachers, friends, relatives and obese students**

#### **3.4.1 Microsystem**

The microsystem includes the associations and collaborations the student has with the family, peers, siblings, childcare providers, communities and teachers (Benjamin, 2015). The microsystem is the student's strongest level where their knowledge is influenced. This is where children learn how to live, hope, and develop rituals and habits (Golden & Earp, 2012). In this system, arrangements and contacts among learners, teachers, peers and the school environment occur. Bronfenbrenner (1979) describes a microsystem as the immediate environment where proximal developments unfold such as schools, home, day care centres, camps, play groups, the neighbourhood, school teachers, peers, and hospitals (Taylor & Gebre, 2016). Students are not mere recipients of the experiences during socialisation but contribute to the construction of such environment.

##### **3.4.1.1 The home and school setting**

Educating the whole child involves addressing both the academic, health, psychological and social needs of students as they are intertwined with students' academic achievement. Formal and informal or the hidden curriculum takes place in school and home settings. The school and the home are the most influential of ecologies where children are discriminated or bullied by their teachers, peers or siblings or parents. Obese children are vulnerable to hostile circles of influence where they are exposed to emotional and behavioural problems. Schools are an important setting in helping students to achieve health literacy, health promotion, personal hygiene and healthy eating habits (Lee, Cheng & St Leger, 2007).

Educators can provide healthy school environment services, such as counselling and psychological services, family involvement, food services, health education, health services, physical education and wellness (Taylor & Gebre, 2016). Unprecedented absenteeism caused by ill-health places obese children at risk for learning difficulties and academic failure.

#### **3.4.1.2 Nutrition and personal hygiene**

Schools are essential in helping learners to achieve health literacy. They are important significant settings to build the skills and capacity for learners, parents and the wider community to combat the challenges of outbreak of communicable diseases (Lee, Wong, Keung, Yuen, Cheng, & Mok, 2008). Lee et al (2008, demonstrates that a hygiene programme can produce a sustained increase in hand washing rates among toilet-trained preschool children.

Hand washing has been shown to be an effective means to prevent the spread of infection (Lee, & Greig, 2010) and subsequently to change behaviour and attitudes. Since March 2020, hand washing, social distancing, using facial mask, no sharing of food, no sitting together watching TV and hand sanitisation are health hygiene measures designed to mitigate the spread of COVID 19 infections (Chang, Yan & Wang, 2020; Zhang, Litvinova, Liang, Wang, Wang, & Zhao, 2020). All these mitigation policies are used both in schools and at home as the most effective circles of influence to children of different age and grades, in both developed and developing countries.

COVID 19 is infectious and dangerous and can lead to death particularly to obese learners with existing comorbidity conditions caused by health consequences that has the potential to induce poor academic attainments. During 'lockdown' learners are faced with food insecurity and hunger which have been linked to poor attendance and low achievement (Boone, Haugh, Pain, & Salins, 2020; Buheji et al., 2020). Teachers and parents were more concerned with obesity and children's academic achievement.

Schools provide food to learners as nutrition programme in schools established by the government to improve academic results and eradicate hunger. As dietary fat is a significant predictor for body size, students who frequently consume high calorie foods tend to have higher body fat (Torres & Nowson, 2007). Consequently, these students may have more problems in their academic performance as they are always tired (Datar & Sturm, 2004, 2006).

### **3.4.1.3 Physical fitness**

Childhood obesity is associated with poor fitness and poor academic achievement (de Almeida Santana, Farah, De Azevedo, Hill, Gunnarsdottir, Botero, & Do Prado, 2017; Datar & Sturm, 2006; Shore, Sachs, Lidicker, Brett, Wright, & Libonati, 2008). Physical activity is the bodily movement that results in an expenditure of energy. Regular physical activity and fitness are important for a healthy lifestyle (Spain & Franks, 2001) as these contribute to a person's health through energy expenditure. Excessive TV watching has been linked to decreased physical activity and an increase in obesity and sedentary behaviour which impinges upon sound academic performance (Burton, & VanHeest, 2007). Schools can influence and engage students in physical activity through Life Orientation during the Physical Education periods which facilitate outdoor activity.

An amplified amount of physical activity during school is linked with enhanced academic performance of children. Children can be physically active by walking from home to school, playing freely at recess or in the school playground, or doing yard work such as gardening at home to keep fit. Variables such as gender, race, and poverty levels of students may exert an impact on students' physical activity, obesity, and academic attainment. Adolescent obesity has an increased danger of developing high cholesterol, hypertension, breathing ailments, orthopedic problems caused by physical sedentariness. PA aimed at increasing physical effort and emotional and social engagement could challenge core executive functions and academic achievement (Diamond & Ling, 2016). Interventions in health, physical, nutrition and personal hygiene can be integrated into other academic disciplines where every teacher shares in the responsibility of teaching healthy lifestyles (Deutsch, 2000).

Through this purposeful teaching, schools can equip students with the information needed to lead healthy lives. Greenleaf, Petrie and Martin (2014) concur that the physical, emotional, mental, and social aspects of health should be addressed through the curriculum since physical activity is given little or no time at all in schools as it is assumed that they are just as time consuming as Life Orientation.

#### **3.4.1.4 Stigmatisation, bullying and peer rejection from the home and the school environment**

Within the microsystem, weight stigma is prevalent, and this has a negative effect on the health and success among school children across several areas such as physical, emotional cognitive and social domains. Weight stigma is prevalent across numerous settings including schools, homes and playgrounds which negatively affects the health and success of learners including personal/physical and social/physiological development and education (Patel & Holub, 2012). Learners that are obese experience victimisation in the form of teasing, peer rejection, discrimination and bullying (Puhl & Suh, 2015).

Research shows that obese children are vulnerable to weight stigma and its negative consequences as perpetuated by peers at school, parents and other family members, teachers, health care professionals, media, and society at large and in clinical settings across cultures and times (Puhl, Peterson, Luedicke, 2013). All these facets ultimately negatively impact on their academic performance. Currently, obesity seems to be the most stigmatising and least socially acceptable condition among children (Di Pasquale & Celsi, 2017; Schwimmer et al., 2003).

Obese children are victimised, verbally abused, teased, socially excluded and bullied by their peers at school (Puhl & Latner, 2007). Weight-based bullying is the most common form of peer harassment reported or perpetuated by students and teachers in schools and these are common settings where weight bias occurs. Educators are causes of weight stigma due to the lower expectations they have of learners with obesity relative to physical, social and academic abilities (Peterson, Puhl & Luedicke, 2012). Students with obesity are regarded as worse in their academic performance than what their test performance suggests (Zavodny, 2013).

In a survey study by Peterson, Puhl and Luedicke (2012), 37% of adolescents reported being victims of bullying and teasing by family members because of their overweight. Family members appeared to be the main perpetrators of interpersonal weight stigma incidents that increase the risk of emotional and psychological consequences among obese children. This makes obese children feel worthless and exerts a negative impact on their academic performance (Willies, Buckett-Milburn, Gregory, & Lawton, 2006). Some learners tend to shun assisting obese peers because of the negative attitudes which develop within the educational context. Learners that are overweight become victims of bullying, teasing and harassment by those bearing healthier weight (Patel & Holub, 2012).

Consequently, this scenario impacts negatively on the academic performance of obese learners (Puhl & Suh, 2015). Children as young as 3 years old, those in elementary schools and adolescent peers have negative attitudes toward obese peers as they are perceived as “sloppy, stupid, ugly and mean” (Neumark-Sztainer & Eisenberg, 2005). In this same study, parents perceived obese learners as victims of bullying due to their body weight. To mitigate the impact of obesity on learner academic performance, schools can partner with families and communities to implement policies and practices that are designed to combat unhealthy living and promote healthful choices that would improve academic achievement.

### **3.4.2 Mesosystem**

Bronfenbrenner (1979) identified the Mesosystem as the second level of the environment where extended family members and poverty interact with the child. A child born in a poor family background cannot do well at school, has low self-esteem and eats what is available just to fill up the stomach even though the food might be low in nutritional value (Puhl, Peterson, Luedicke, 2012). In this level, the child interacts with two sets of adults, that is, the teacher and the parent or guardian. The socio-economic status at home can exacerbate the impact of obesity which has an adverse impact on learning (Purtell & Gershoff, 2015).

### 3.4.3 Exosystem

The interaction between learners and teachers is found in the macrosystem, where beliefs, risks, lifestyles and opportunities of social exchange are rooted. In the macrosystem, cultural values impact the student and regulate behaviour in the other systems (Golden & Earp, 2012). The type of food, eating patterns and the rate of eating and the learned habits of eating form part of the macrosystem. Campbell and Haslam (2005: 25) echo that there is an association between the development of obesity and accessibility to foods containing high sugar and fat content. At school, children enjoy food that vendors sell in their school premises despite the nutritious food provided by the government (NSNP). This type of food increases opportunities of obesity which further creates the risks of discrimination, isolation, stigmatisation, physical inactivity and eventual low performance at school.

The obesity risk levels can be conceptualised using Bronfenbrenner's (1979) Socioecological systems theory. The Social Ecological Model Theory of Health Promotion represents a multi-level approach to health. It embraces multiple dimensions of influence, putting the individual at the central point, enclosed by a plethora of facets which represents the personal, community, organisational and policy levels (Bronfenbrenner, 1979). It provides a structure regarding the way in which individuals and the social environments in which they exist influence each other across the lifespan (Carey, Singh, Brown & Wilkinson, 2015). The personal level seeks to increase the knowledge and influence of the individual on their beliefs and attitudes regarding health (Salazar, Bradley, Younge, Daluga, Crosby, Lang & DiClemente, 2010).

The SEM places interest on providing individuals with suitable and high-quality information pertaining to the prevalence of obesity and its long and short-term consequences in the lives of adolescents. The community level of the SEM stands for the interpersonal standpoint which focuses on the modification of the behaviour of individuals through cultural and social norms which come from overcoming barriers at the individual level (Golden & Earp, 2012).



### **3.4.4 Macrosystem**

This dimension of the model focuses on events which relate to the level of an organisation (Bronfenbrenner, 1979). These are aimed at facilitating the behaviour of individuals through influencing organisational systems and policies with regard to social challenges (Salazar et al., 2010). These are exemplified by employers or work sites, health care systems, local health departments, and organisations of professional standing. It also entails the type of food consumed in the family and the school. Culture and fast foods restaurants play an important role in determining the type of food and the eating patterns.

### **3.4.5 Chronosystem**

This is the level that stands for the events at the level of civil society, and which are intended to allow for individual behavioural change (Golden & Earp, 2012). The last dimension reflects activities which are a hindrance at the policy level; these are focused on the interpretation and application of policy. The spheres of government might support policies which strive to promote behaviours which foster health (Carey et al., 2015). This is related to this study as policies that are crafted at the organisational level can help shape the way in which obesity might be understood, mitigated and managed to facilitate the successful learning of children. The SEMT is indeed a framework for the conceptualisation of the prevalence obesity, causes of obesity and the impact of obesity on the academic achievement of rural secondary school learners in Mvudi circuit of Vhembe District.

The Social Ecological System with its conceptualisation of growth is preferred for effective exploration and description of the behaviours which are health-risk (Salazar et al. (2010). The degree of interaction within the different dimensions of the SEMT helps to understand and perceive the responses of adolescents on the specific behaviours that expose them to health problems (Bronfenbrenner, 1979). Social-Ecological Model Theory (SEMT), is a highly adaptable framework which addresses the issues of overweight and obesity, exhibits the distinct yet interrelated factors which affect human behaviour (Hamre, Kuester, Renaud, Williams-Piehot, Franco, Roussel, & Herseyet, 2006).

The Social - Ecological theory has been used to guide research in various areas of child development, such as human rights, developmental risks and childhood obesity (Benjamin, 2015). According to the Social-Ecological Theory (SET), childhood obesity is associated with risk factors at the individual, familial, organisational and societal levels (Peppler, 2017). Behavioural change can be influenced within the different health levels for instance, and the reciprocal relationship between adolescents and their peers such that intervention strategies targeting obesity could be designed successfully.

Ecological frameworks are important because they significantly address global epidemics of childhood obesity and overweight and assist in the designing of appropriate intervention strategies (BeLue, Okoror, Iwelunmor, Taylor, Degboe, Agyemang et al., 2009). Given the South African multicultural and multiethnic context, obesity is caused by different aspects within different ecologies and settings where individuals interact. Bronfenbrenner (1979) proposes that the Ecological Systems Theory (EST) construes all individuals as part of interrelated systems that locate the individual at the centre from which they move to include all other systems.

### **3.5 CONCLUSION**

Theories and models discussed in this chapter strive to explain and understand the possible explanations behind obesity and its impact on academic performance. Based on the systems ecological theory, the subsequent chapter maps the methodological application of systems theory to the challenge of obesity in Vhembe District.

## **CHAPTER 4**

### **RESEARCH DESIGN AND METHODOLOGY**

#### **4.1 INTRODUCTION**

Chapter 3 presented the theoretical framework that underpins this study on the impact of obesity on learner academic performance in rural secondary schools of Vhembe District. This chapter presents and discusses the research study setting, research paradigm, research approach, research design and research methodology. It also describes the sampling techniques used, population, sample technique, research instruments and the pilot study.

#### **4.2 RESEARCH STUDY SETTING**

The collection of data was conducted in five (5) public rural secondary schools in the Mvudi Circuit of Vhembe district. The district is one of six in the Limpopo province situated in the far North of the Limpopo province and consists of five circuit clusters with 26 circuits based on the new restructuring of the Education Department in the Limpopo province. In this study, the focus was on Mvudi Circuit consisting of nine rural secondary schools. The schools are mixed-sex schools. The classes have high numbers of learners, averaging about 60 learners per class.

#### **4.3 RESEARCH PARADIGM**

A paradigm is a system or a complex of beliefs and values; it is a world view that researchers uphold that influences the researchers' approach towards a full understanding of the conundrum (Elshafie, 2013; Antwi & Hamza, 2015). A paradigm directs researchers in making choices on methods and approaches. It is a "norm that every research study is underpinned by a philosophical framework that shows the worldview in which the research is located, and is thus exhibited throughout the research process" (Quinlan et. al. 2011:95).

Quinlan, Babin, Carr, Griffin and Zikmund (2011:95) postulate that "every project is underpinned by a philosophical framework which depicts the worldview in which the research is situated, and which can be seen in every step of the research process." This philosophical perspective is divided into ontology, epistemology and methodology. Ontology refers to the nature of reality, whether it is objective or subjective (Patton, 2002), even though this paradigm's reliance on subjective interpretation results in potential misconceptions and self-deceptions. Stringer (2014) argues that it may also lead to the discovery of new, unanticipated insights. This study is positioned in the Pragmatic paradigm.

My epistemological assumptions were shaped by the ontological assumptions in line with the assertions by Guba and Lincoln (1994), that answers to the epistemological question are determined by response that are given to the ontological question. In seeking to understand the impact of obesity on learner academic performance in rural secondary schools in Vhembe District, I adopted both the objective and subjective approaches for a complete understanding of the study. The objective knowledge was gathered by using quantitative approaches that sought to establish the patterns and trends of the attitudes of learners on the impact of obesity on their academic performance in rural secondary schools.

The subjective view of the study was catered for by the qualitative interviews which strove to gather the opinions and perspectives of participants on the impact of obesity on learner academic performance. The pragmatic paradigm allowed me to interact with the participants, to gain insights and form a clear understanding of the nature and extent of the impact of obesity on learners' academic performance in rural secondary schools. Guba & Lincoln (1994) conclude that research paradigms serve as a pattern or model for a study where there are three major paradigms to the verification of theoretical proposition. These are positivism, interpretivism and pragmatism. This study is underpinned by the pragmatic paradigm which is discussed in the section below.

#### **4.3.1 Pragmatism paradigm**

Pragmatism provides a philosophical framework that is used in mixed-methods research (Tashakkori & Teddlie, 2003; Somekh & Lewin, 2005). Pragmatism provides an opportunity for "multiple methods, different worldviews, and different assumptions, as well as different forms of data collection and analysis in the mixed methods study" (Creswell, 2003). Similarly, Greene, Kreider and Mayer (2005: 275) view pragmatism as an "inclusive philosophical framework that promotes the use of both qualitative and quantitative research methods to provide comprehensive answers to the research questions." This paradigm allows for understanding the context-specific and subjective meanings regarding the topic, in this case the impact of obesity on learner academic performance in rural secondary schools in Mvudi circuit of Vhembe District.

Pragmatism is results oriented and focused on understanding the meaning of things (Johnson & Onwuegbuzie, 2006; Biesta, 2010). It is basically driven by anticipated consequences, combining elements of qualitative and quantitative research approaches, and logically setting primary focus on the research questions in the quest to address the research problem (Tashakkori & Teddlie, 2003).

#### **4.4 Research methodology**

Rajasekar, Philominathan and Chinnathambi (2013) define "research methodology as a systemic and organised way of showing how research is to be carried out for gaining knowledge in solving a research problem." It pertains to an analysis of assumptions, procedures and principles as an approach to inquiry. The choice of research methods informs the decision regarding the conduct of the study to allow for the collection of data as a basis for explanation, inference, prediction and interpretation (Cohen, Manion & Morrison, 2007). This study used both quantitative and qualitative research methods to interrogate the impact of obesity on learner academic performance in rural secondary schools in Mvudi circuit of Vhembe District.

## **4.5 Research design**

According to Babbie and Mouton (2006) a research design is a plan or blueprint of how the research is conducted. McMillan and Schumacher (2001:30) aver that “a research design describes the procedures for conducting a study, including when, from whom and under what conditions the data will be obtained.” It is an overall approach that can be used to investigate the problem of interest that is to shed light on, or answer the question of interest or to test the intended hypothesis (Babbie, 2008). Research design concerns the framework in conducting a study and is used as a guiding principle in the collection and analysis of relevant data. Therefore, a research design, relates to the way in which a study should be implemented (Merriam, 2013); where sets of instructions and guidelines are used to address the research question (Rahi, 2017).

Research design aims to provide direction for the gathering of relevant data in a cost-effective manner. McMillan and Schumacher (2006: 246), posit that “research design describes how the study is conducted, respondents are selected, data is collected, analysed and how the findings are communicated”. Creswell (2009:54), describes a “research design as a strategy for choosing research subjects or participants, sites and data gathering methods that were employed to achieve the research objectives. This study employed the mixed methods research. This mixed method is often used to enrich the research, thereby increasing the depth and quality of the study findings.

### **4.5.1 Mixed-methods research approach**

Jones, (2017); Greene (2007); Cresswell and Plano Clark (2007), define mixed methods research as providing the same results where a research strategy uses two or more methods. Creswell (2015) further points out that mixed method research uses a specific design, in this case the Convergent Parallel Mixed Method Design was used to interpret, integrate and triangulate the quantitative and qualitative data.

#### **4.5.1.1 The justification for using mixed-methods research design**

The justification for using a combination of both quantitative and qualitative approaches in this study is to have a deeper understanding of the problem under investigation and ensuring that the research results are credible (Kettles, Creswell, & Zhang, 2011). A variety of epistemological positions can occur if mixed methods are used to gather valid and reliable data that complement, corroborate and validate one another. Quantitative approaches were adopted to facilitate the generation of data using a survey questionnaire (Cooper, Porter & Endacott, 2011). Table 4.1 depicts the methodological framework that guided the conduct of this study.

### **4.6 The Quantitative Strand**

Quantitative methods use numbers as for making generalisation about a phenomenon. “Quantitative researchers collect data in the form of numbers and use statistical types of data analysis” (Terre Blanche & Durkheim, 1999: 166). This study employed the survey method in the form of close-ended questionnaires to collect primary data from the respondents.

#### **4.6.1 Population**

De Vos (2010: 55) defines “population as the group upon which the researcher is interested in making inferences.” This is echoed in an earlier submission by Parahoo (1997:86) who avers that the population of a study refers to “the total number of units from which data can be collected. The population of this study is comprised of school learners currently in Grade 10 and 11 from the rural secondary schools in Mvudi circuit of Vhembe District.

#### **4.6.2 Sampling procedure and study sample**

Sampling refers to the selection of a segment that is representative of a whole in both qualitative and quantitative studies (Mweshi & Sakyi, 2020; Leedy & Ormrod, 2005). Sampling is deemed critical in the research process as it determines the quality of inferences made from the findings (Onwuegbuzie & Collins, 2007).

Since it was not possible to collect data from the whole population, sampling had to be done to come up with a manageable number of participants. Polit and Hungler (2001) refer to a sample as a part or subset of a population. In this study, the sample denotes a group of research participants that participated in the study, and this was drawn from the five rural secondary schools in the Vhembe District.

#### 4.6.3 Sampling procedure

Simple random sampling procedure was used to select respondents for this study. Simple random sampling ensures that every element of the population has an equal probability of being included into the sample” (Etikan & Bala, 2017). The list of learners in Grades 10/11 were managed distinctively according to the 5 schools selected for the study. All learners were considered suitable for the study as they were prone to the effects of obesity as candidates or being in contact with an obese peer as they might be victims or perpetrators or bullies to obese classmates.

**TABLE 4.1 Sampling techniques and sample sizes**

Research strand	Sampling technique	Data collection instruments	Participants	Sample size	Gender
<b>Quantitative</b>	Probability: Simple Random sampling	Self-designed close-ended questionnaires	Grades 10 / 11 learners from sampled rural sec. schools	125 Respondents	Mixed gender
<b>Qualitative</b>	non-Probability: Purposive sampling	Semi structured In-depth individual face to face interviews and discussions and observation.	Grades 10 / 11 learners & teachers from sampled rural sec. schools	10(ten) Participants comprised of five (5) learners & 5 teachers	Mixed gender



Data collection is an extensive activity (Merriam, 2009; Creswell, 2012, Atkins & Wallace, 2012). Leedy and Ormrod (2012) observe that the process of data collection does not mean mere gathering of data but denotes first the selection of relevant data then carefully collecting it to ensure that it is adequate for making reliable conclusions. So, the gathering of data is crucial. No matter the type of data an individual considers in an investigation, the first requirement for empirical studies is detailed knowledge of related literature.

#### **4.7 Data collection procedure**

For the quantitative data collection strand, self-designed close-ended questionnaires were used as data collection instruments.

#### **4.8 Instrumentation**

Ponto (2015) defines instrumentation as a variety of research methods used to recruit participants, collect data, and use of various tools to collect data. Different data collection strategies were used for the two strands of the study.

##### **4.8.1 Quantitative data collection instrument**

In this study, close-ended questionnaires were used to collect quantitative data.

###### **4.8.1.1 The questionnaire**

A questionnaire is composed of several questions printed or typed in a sequence (Kabir, 2016). Teddlie and Tashakkori (2005) posit that a questionnaire is a self-composition data collection instrument that each research respondent completes. I designed the self-constructed questionnaires as it seemed inexpensive to design and administer to respondents.

A questionnaire seemed most efficient quantitative data collection instrument that was administered to many respondents within a short period. Self-constructed questionnaires were administered to one hundred and twenty-five learners (125) both boys and girls currently in grades ten (10) and eleven (11) from the selected

sampled rural secondary schools to enable the researcher to obtain numeric data for the study. The self – constructed questionnaire afforded me the opportunity to design close- ended questionnaires that ensure that responses were uniform as options were provided for the respondents to select from. The questionnaire for this study was a 5-point Likert-Scale type with a neutral option and comprised of three sections: A scale is a series of grading describing the degree of something while also providing high levels of flexibility. The questionnaires were constructed based on literature study, objectives and specifically designed to collect data regarding the impact of obesity on learner academic performance. The 5-point Likert-Scale had multiple choice options where respondents can choose from. Respondents' identities were hidden using pseudonyms to maintain confidentiality and anonymity.

The questionnaire had three distinct sections:

- (1) Section A: Biographical Information; (2) Section B: and (3) Section C: The extent to which they agree or disagree with the statements on the causes and impact of obesity on learner academic performance in rural secondary schools.

In the process of developing the questionnaire, as recommended by Babbie & Mouton, (2001), the:

- Questionnaire items were simple, short and instructions were clear, enabling the respondents to answer the questions with ease to avoid ambiguity and loaded items through making them short, clear and simple.
- The clarity of the questionnaire was achieved through a pre- test which was well responded to by the pre-testing respondents.
- font size used was legible enough and the printing was neat and clear.
- questionnaire had five pages printed on a single side and fifty-five self-designed close-ended items developed based on the research objectives.
- length of the questionnaire was reasonable, it required a reasonable budget and printing was affordable.
- sequence on the questionnaire started with easy questions that entail biographical information to screen respondents in terms of their gender, age range, educational level and school quintile and a five Likert-Scale that had close ended response scale which is an ordinal measure of the respondent's

attitude on how they feel about something. The Likert Scale had five response categories that included a neutral option.

I administered the questionnaires after the respondents had signed informed assent forms to participate in the study. I reassured the respondents on anonymity and confidentiality by stressing that the answers they gave would be kept confidential and responses would be used for the purpose of this study only. I personally administered the questionnaires to the respondents. It was challenging because some learners thought they were to get remunerated after being part of the sample. I disclosed that participation was purely voluntary, and they could withdraw at any time if they so wish, they won't face any penalties upon their withdrawal and there won't be any remuneration for partaking.

#### **4.9 DATA ANALYSIS AND INTERPRETATION**

The aim of this section was to discuss the steps and procedures that were followed to interpret and analyse the data obtained. Bertram and Christiansen (2014:115) define "data analysis as a process that involves closely and systematically examining a whole by separating the whole into smaller parts to facilitate its examination". In the same vein, De Vos (2010:134) states that "data analysis is the procedure of trying to understand the findings where you logically arrange the interview transcriptions, field notes, and other materials accumulated, then draw some valid conclusions". The two data sets, quantitative and qualitative data were systematically analysed and presented separately and merged at interpretation to give breadth and depth to the study. These formed a basis for the generalisations and recommendations made on the impact of obesity on learner academic performance.

#### **4.10 Quantitative data analysis**

Quantitative data was numeric data generated from the questionnaires that had been administered to 125 learners. In this study descriptive data analysis was employed. Quantitative studies emphasise the use of numerical measures to arrive at specific findings.

Data were analysed using the Statistical Package of Social Sciences (SPSS version 25). Each questionnaire was assigned an identification code to uphold anonymity and confidentiality. Information from questionnaires was also given a code for each question. The data set was created in the Microsoft excel spreadsheet based on the defined variables to establish the desired number of cases. The process involved the employ of scale variables and categorised variables.

In this study, the categorical values were used for biographic while the Likert type scale with strongly agree, agree, neutral, disagree and strongly disagree were adopted. Data were entered as guided by information reflected on the questionnaire. The analysis proceeded by selecting the required output from a menu to produce tables to represent information. The graphical presentation of data was complimented by descriptive analysis to draw conclusions from the statistical operations regarding the impact of obesity on learner academic performance.

#### **4.11 The Qualitative Strand**

The qualitative strand is the one that does not use numbers as it is interpretive in nature. Bogdan and Biklen (2007) define qualitative research methods as “an approach to social science research that emphasises collecting descriptive data in natural settings, uses inductive thinking, and emphasises understanding the subjects" point of view". I used qualitative methods as they aid in providing rich descriptions of phenomena, enhance understanding of the context of events as well as the events themselves, enhance peripheral vision, which was important at the early stages of inquiry.

Through qualitative methods, it assisted me to identify patterns and configurations among variables and to make distinctions. Thus, qualitative research not only serves the desire to describe; it also helps move inquiry toward more meaningful explanations. According to Cohen et al. (2011), qualitative methods ensure the collection of verbal and textual information. Qualitative methods include direct observation, document analysis and overview, participant observation, and open-ended unstructured interviewing.

These methods are designed to help researchers to understand the meanings people assign to social phenomena and to elucidate the mental processes underlying behaviours. Qualitative approach afforded me the opportunity to provide a thick description of subjective experiences based on qualitative data. In addition, Maxwell (2012) substantiates that qualitative studies help researchers to gain a deeper insight into a situation of concern. Myers (2013) states that the basic advantage of qualitative research is that it assists in understanding the environment or situation in which events take place.

Qualitative methods were adopted to gather detailed information on the effects of childhood obesity on learner academic performance using research instruments that include interviews discussions and observations (Ritchie, Lewis, Nicholls, & Ormston, 2013). In this study, in-depth interviews and discussions and observations were used to elicit information from the participants to obtain qualitative data. Blanche and Durkheim (1999) stated that qualitative research is concerned with developing clarifications of social phenomena. It is important to note that data collection and analysis procedures in qualitative research are collaborative (Nieuwenhuis, 2016:114; Smit, 2002:66) so the provisional outcomes of the study should be traced to the context of the data. Coding is the process of labeling and organizing qualitative data to identify different themes and the relationships between them. I read through the transcripts, make notes and label relevant and related words to develop themes. In observations I noted down similar non-verbal gestures.

#### **4.11.1 Population**

The population of this study is comprised of teachers and learners in rural secondary schools in Mvudi circuit. I selected individuals who are information rich in respect of the aim of this inquiry. The participants, selected by means of purposive sampling, met certain criteria: they had shared experiences or characteristics in relation to the impact of obesity on learner academic performance as they might be victims or perpetrators.

#### **4.11.2 Sampling procedure and sample**

The study adopted purposive sampling procedure to select learners and teachers who were either victim, perpetrators and knowledgeable about the impact of obesity on learner academic performance in rural secondary schools. Babbie (2008) states that purposive sampling is choosing data rich cases for in-depth information. Purposive sampling is used to select information rich cases, with in-depth knowledge and information obtained through experience about the phenomenon under study (Braun & Clarke, 2019). van Rijnsoever (2017) avers that qualitative research samples tend to be small so that they can support an in-depth analysis of selected cases. Qualitative samples are purposefully selected. They are supposed to provide richly textured information, that is, data which is relevant to the phenomenon of study.

Each sampled rural secondary school was represented by only one (1) teacher and 1(one) learner participant selected from the quantitative sample to form the qualitative sample. Hammarberg, Kirkman, and de Lacey (2016) opined that in qualitative research, a larger sample size does not help to establish applicability, because larger samples can dilute an individual's voice and create a problem of breadth over depth in the research and can hamper the ability to analyze the data adequately. In this study, only 10 participants were interviewed and observed. Teachers currently teaching in Grades 10/11 and learners currently in either Grades 10/11 from the five-sampled rural secondary schools formed the qualitative sample. This agrees with (Merriam & Tisdell, 2016:20) who avers that "purposive sampling focuses on small samples which are supposed to mirror real-life circumstances". This was for the purpose of validation and confirmation of the quantitative data. The size of qualitative samples is generally small because they are meant to reflect detailed perspectives on the phenomenon under study (Dawson, 2002:49).

I used the following criteria for selecting participants for the study:

- Only learners in either Grades 10 or 11 and registered in the school for that academic year were sampled;

- Only teachers who were teaching in either Grades 10 or 11 in the sampled school and willing to engage in an In-depth individual face to face interviews and discussions regarding the topic under study were selected;
- Learner participants were selected based on their participation in the quantitative sample. All participants were grades 10 and or grade 11 learners and teachers from the five-sampled rural secondary schools in Mvudi circuit of Vhembe district.

#### **4.11.3 Interview schedule**

Khan (2020) avows that data collection for qualitative research is an intimate process where the interviewer and Interviewee are in a mental embrace. Devotta, Woodhall-Melnik, Pedersen, Wendaferew, Dowbor, Guilcher and Matheson (2016) describe an interview as a “conversation with a purpose”. This study used two qualitative data collection instruments, namely, interviews and observations. Since the nature of the research problem seemed sensitive, a qualitative data collection method seemed appropriate for this study. My choice of a qualitative method was also driven by the fact that it permits an in-depth, explorative, descriptive, and contextual engagement with the issue.

Clearly, qualitative research necessitates a multi-perspective approach (utilising different qualitative techniques and data collection methods) to social interaction (Merriam, 1998:5). I used interviews and observations as qualitative data collection techniques. I prepared for the interview in a natural setting which was the school environment. As I started to conduct in-depth interviews, I requested the participants to use my cell phone to record the interview sessions and assured them that those recordings will be listened to by me only. I observed the feelings, gestures, fear, pain and write down notes to avoid loss of information. In an interview activity, the interviewee provides information about his feelings, opinions, and events as they occur to others or occurring in his life, while I the interviewer, (myself as the researcher) assume the task of listening properly with understanding, write down non-verbal gestures and important points for reporting purposes.

The sense of sight and hearing were mostly used during interviews. During this mental embrace, I tried to be neutral and did not want to disclose my opinions and avoid disclosure of personal beliefs in order not to influence the respondents. I tried to use identity management strategy so that I “understand the world from the subjects’ points of view” and avoid being bias. In trying to gain in-depth information about the impact of obesity on learner academic performance, extra care was exercised to ensure that this mental embrace that we engaged in does not exploit vulnerable populations who are the victims of obesity. Qualitative research implies that data can be combined through verbal interaction between individuals or groups. To protect the interviewees identities, pseudonyms such as PT1-PT5 and PL1-PL5 were used to ensure the respondents privacy and respected the participants’ autonomy.

#### **4.11.4 Data Collection Procedure**

For the qualitative data collection strand, face to face in-depth interviews and observations were used to collect data for this study.

##### **4.11.4.1 Interviews and discussions**

The main strategy that was used to collect the qualitative data was the in-depth interviews and discussions. The technicality is that you interview and observe the participants concurrently. In- depth individual face to face interviews and discussions and observations were used to generate qualitative data. One strength of a face-to-face discussion is that the interaction of participants and researchers normally has a capacity to bring out detailed information on the subject under investigation (Ary, Jacobs, Sorensen & Walker, 2013) and provide richness of data on the topic under study.

##### **4.11.4.1 In - Depth Individual face to face Interviews**

Seale, Giampietro, Gubrium and Silverman (2004) define an interview as a social encounter where speakers collaborate in producing reflective and prospective accounts or versions of their past or future actions, experiences, and feelings.



All the interviews were done at the selected sampled rural secondary schools, which were the natural settings of the participants to reflect their lived experiences (MacMillan and Schumacher, 2010:331). In-depth face to face individual interviews and discussions were administered to provide a conducive context for the research participants to share openly and honestly their knowledge and experiences about the impact of obesity on learner academic performance. Participants were given a two-week interview schedule, where they were asked to indicate the dates and times when they prefer to be interviewed.

I personally conducted all the interviews in person to ensure all critical data was captured to respond to the research questions and the main objective of the study. All participants that had agreed to participate in the study were made to sign consent forms prior to the process of interviews. These were signed before the interviewer as an indication of commitment to the undertaking. Interviewees were interviewed in private rooms in those selected schools which they provide a safe natural environment considered natural settings of the participants and free from disturbances. Most of the interactions took place in offices during free periods, break time and lunch hours. Each interview lasted between 20 and 30 minutes.

Prior to the actual conduct of interviews, I thanked each participant for the time and willingness to be part of the study. It was explained to them that the interviews proceed in the form of a defined structure and that probing questions would be determined by the information which they would have provided. The probing and reading of non-verbal cues such as gestures provided knowledge and meanings which were useful to understand the phenomenon under study. This is supported by Palmer, Larkin, Visser and Fadden (2010) who content that probing and non-verbal cues are important in gathering information from participants in a study. Participants signed an informed consent and accent forms. I also asked for permission to record the interviews to avoid any loss of data.

In this research, verbatim accounts from the interview transcripts were extracted in order to illustrate the tone, sense, intentions and emotions of the participants (Pazvakavambwa 2016:140; Morrow, 2005:253).

The entire approach was ideal since it offered me an opportunity to gain in depth textual data concerning learners' experiences on the impact of obesity on learner academic performance in rural secondary schools in Mvudi circuit of Vhembe district.

#### **4.11.4.2 Observation**

Observations are part of interviews. During face-to-face interviews, I had the opportunity to view, communicate, know and hear and listen to the participants' views regarding the study. Observation provides me with information about emotions and reactions of participants' feelings, and gestures that cannot be communicated but observed. Purposeful sampling was used to seek information-rich cases which can be studied in a natural setting (Patton, 1990). Observation involves physical observation and recording of data on the observation schedule for analysis. Leedy and Ormrod (2014:45), aver that intentionally unstructured and free flowing observations in a qualitative study allow the researcher to be flexible, shifting his or her focus from one thing to another, as certain events or important objects present themselves in the situation. Observations that were "human instrument" in nature afforded me the opportunity to hear, see and asses the participant's tone about the topic under study.

McMillan and Schumacher (2010:439) revealed that when a researcher observes, there are some non-verbal signs such as facial expression, expressions, tone of voice, body movement and other universalized social interactions that indicate the implicit sense of language that he or she (the researcher) documents. Observations also enables a systematic understanding of the phenomenon under study as it was used in conjunction with interviews. Observations assist in yielding better results when used together with interviews as in this study. In various schools, I observed 10 participants comprised of teachers and learners in an interview and discussion sessions. I was interested in observing how teachers, obese and non-obese learners interact in the school environment setting. Van Zyl (2014:34) emphasizes that "observations are the systematic description by research of events, behaviours and artefacts in their context."

Through observation I managed to receive first-hand information in a natural setting (school). Observations afforded me the opportunity to see and hear how obese learners are perceived and treated in schools in relation to learning and academic performance. Through observations I gained more in-depth information, rich detailed data that gives insight into the participants' experiences of the world that was difficult to convey quantitatively. Qualitative observation approach was deemed most suitable as (Natasha et al., 2005) aver that qualitative research is a type of scientific research which consists of an investigation that seeks answers to a question that systematically uses a predefined set of procedures to answer the question. It collects evidence, produces results that are not pre-determined and produces results that can be generalised as I act as the "human instrument" of data collection using an android cellphone to record interview discussions and observation sheet with questions written on it.

Observations were direct and covert as I also studied interactions among obese and non-obese learners and teachers and their environment in relation to academic performance. Qualitative method was humanistic in nature as it afforded me the opportunity to study subjects qualitatively and personally know them. I collected data in a natural setting as the source of data where I was afforded the opportunity to observe and interpret settings as they were. McMillan and Schumacher (2010:437) note that in their view, "field observations include watching how the participants communicate with each other. When I observed learners and teachers communicate, learners who looked "big" and obese were reserved, shy, excluded, introverted, and avoided discussing about obesity.

They seemed emotionally disturbed and rail in emotional pain. Observing such happening, I interpreted my observations that obese learners seem to be victimized, marginalized, bullied, excluded and made fun of in the teaching and learning environment which hamper their academic attainment. Since this dyadic relational communication, it assisted me to see the world through the eyes of the participants.

#### **4.11.4.3 Permission to digitally record the interviews sessions**

This research study used the qualitative interview approach to gather information rich data about the participants' thoughts, knowledge, beliefs, perceptions and understanding about the impact of obesity on learner academic performance, a process that permitted me to enter the inner world of another person to gain an understanding of that person's viewpoints (Johnson and Christensen, 2011:202, Pazvakavambwa, 2015:137). Interviews and discussions were recorded through an android cell phone to record all the important information and observations were used as data collection tools. Due to some non-verbal communication, which was important for the interpretation of the data that the android cell phone recorder could not capture, I used a notebook and observation sheet to write down what I observed during the interviews and discussions sessions.

#### **4.11.4.4 Management of data and its safe keeping**

As indicated in data collection strategies, I assured the research participants that the data gathered will be used for the purpose of this research only and no one will have access in using it. Management and safe storage of data are fundamental in research. For the two strands of data collection, I administered questionnaires and employed in- depth interviews and discussions and observations as data collection instruments. I used close - ended questionnaires to collect quantitative data from respondents and an android cell phone to collect verbal information from participants. The respondents' words, tone, pauses, and phrases were recorded in a permanent form (android cellphone and observation sheet) that could be listened to and read repeatedly. All this electronic information was stored on a password-protected (encrypted) laptop in a typed form by data capture who typed the data verbatim. In addition to storing all the responses from the interviews electronically, I opened a ring-binder file that was kept under lock in a safe cabinet wherein all the questionnaire responses, electronically typed encrypted data and observation sheets were safely kept.

#### **4.11.4.5 Triangulation Design**

This is the most common and well-known approach to mixing methods as described by (Creswell, Plano Clark, et al., 2003). The purpose of this design is “to obtain different but complementary data on the same topic” (Morse, 1991, p. 122) to best understand the research problem. The intent in using this design is to bring together the differing strengths and nonoverlapping weaknesses of quantitative methods (large sample size of 125 respondents’ learners) with those of qualitative methods (small N for 5 teachers and 5 learners, face to face, in depth interviews and observations) (Patton, 1990).

I used triangulation design as a single - phase design to compare and contrast quantitative statistical results with qualitative findings to validate and expand quantitative results with qualitative data to have mixed methods research. The single-phase design is the reason it has also been referred to as the “parallel convergent triangulation design” (Creswell, Plano Clark, et al., 2003). It generally involves the separate parallel, collection of quantitative and qualitative data so that I best understand the research problem. During the data interpretation and analysis phase, I merged and converged the two data sets by contrasting and comparing, typically by bringing the separate results together in the interpretation through integrating the two data types during the analysis stage.

#### **4.12. Data analysis and interpretation on interviews and observations**

Qualitative data analysis is generally described as a nonlinear, iterative process. De Vos (2010) states that qualitative data analysis is the process of logically arranging the interview materials that are usually transcriptions, field notes, and other relevant materials to aid the researcher’s understanding of them before data interpretation. The interview data was analysed using content analysis which Creswell (2014) states that it is comparing of the words used in the answers of the respondents. This means that a word-based content approach had to be used to transcribe the data from all the raw information sources that included the participants’ responses during conversations, interviews and all the notes and journals generated during the research (Du Plooy-Cilliers, Davis & Bezuidenhout, 2014).

I had to study the notes written in the field, transcribed raw data gathered through android cell phone and carefully listen through them to group data into themes for purposes of analysis. Data reduction, which also formed part of the data analysis approach was used. I chose the data that seemed important, simplify it and convert data that appear in transcriptions. It occurs through coding, whereby data were condensed without significant loss of information, so that a drawn conclusion can be verified. Notes were made to capture recurring concepts, common themes, events and other patterns in the data. I captured and transcribe recurring concepts and categorise common themes from collected data. My data analysis strategy design followed a narrative analysis approach.

These were labelled and referred to as open coding where raw data was organised to make sense of it. Through Axial coding, coded data was sorted, classified, interconnected and categorised into themes. I manually did the coding to identify emerging themes. Although it seemed time consuming, it was worth doing it to arrive at credible and valid results. I identified common themes, patterns and relationships as there are no universally applicable techniques that can be applied to generate findings in qualitative data analysis. I summarised my data by trying to link it to my research aim and objectives. Then the analysed categories were ready to be written up in a report, or as in this case, a major research project known as a thesis.

#### **4.13 Quality assurance measures for the study**

The use of parallel convergent mixed method design required separate quality assurance measures for each strand for quantitative and qualitative. I presented the quality assurance measures for each strand of the mixed method study separately except for one quality assurance measure. Piloting of the data collection instruments was done for both the quantitative strand and qualitative strand of the study. This agrees with Strydom and De Vos, (2011) who aver that a “pilot study is a small study conducted prior to a larger body of research, to determine whether the methodology, sampling, instruments, and analysis are adequate and appropriate”. Pre-testing or pilot testing an instrument facilitates the identification of errors and flaws thereby giving room for the refinement of the instrument.

The questionnaire was piloted with twenty learners and five teachers to establish flaws in the data collection tool. Suggestions from respondents were included in the questionnaire revision.

#### **4.13.1 Quantitative Quality Assurance Measures**

This section describes the validity and reliability of the study.

##### **4.13.1.1 Validity of the Study**

Validity of the study refers to the extent to which obtained results are true, convincing and believable (McMillan & Schumacher, 2001). It also denotes the extent to which the research instrument produces outcomes for which it is designed to measure (De Vos et al., 2005). Internal validity, which is the manner in which the study is carried out, was achieved through the constitution of a representative sample. I had to ensure that the items included in the questionnaire provided a balance with regard to the objectives of the study. The instrument was also piloted prior to its administration to ensure that it was fit for purpose regarding the impact of obesity on learner academic performance.

##### **4.13.1.2 Reliability of the study**

The reliability of a study lies in the consistency of results over time. This means that if a similar study is conducted in a similar context under the same conditions, then the results should be the same the same variable is measured under the same conditions. In other words, reliability denotes that an assessment instrument's management to produce same results in a reasonably long period of time (De Vos, 2005). To ensure reliability of data gathered in this study, I asked a colleague who is knowledgeable and experienced on issues of obesity and its impact on learning to assess the prepared research questionnaire items and advise accordingly. In relation to this, some questions were restructured to improve their clarity while those that seemed irrelevant were removed from the set.

#### **4.14 TRUSTWORTHINESS OF QUALITATIVE**

Trustworthiness of qualitative findings relate to methods which are employed to establish research rigour. This is a concept that assist in the prevention of errors (Chauvette, Schick-Makaroff & Malzahn, 2020). The purpose of trustworthiness in a qualitative study is to promote the understanding of a phenomenon, within a specific context, and not to generalise the results to a broader population (Du Plooy-Cilliers, Davis and Bezuidenhout, 2014:258). Trustworthiness of a study is achieved through the establishment of credibility, dependability, confirmability and transferability.

##### **4.14.1 Credibility**

Credibility refers to the believability of the research findings (Korstjens & Moser, 2018). It is the confidence that can be attached to the outcome of a study. This method endeavours to find out whether the research results are a representation and correct interpretation of the original data from participants (Bagherniya., Darani., Sharma., Allipour-Birgani., Taghipour. & Safarian, 2019). Credibility was achieved in this study through prolonged engagement with the participants to build trust with them as well as obtain rich data and debriefing. I also performed persistent observation of the phenomenon of study as well as triangulated sources and methods for data validation. I tried to interpret the data provided by the participants as much accurate and faithful as possible.

##### **4.14.2 Transferability**

This concerns the degree to which the results of an investigation can be transferred to other similar settings or contexts with the involvement of other participants (Merriam & Tisdell, 2016). It also pertains to the generalisability of data (Trimmer, 2020). This was established in this study through presenting thick descriptions of the processes of the research. The study detailed the procedures and processes used to address the problem. This included the pragmatic paradigm, mixed methods approach and the quantitative and qualitative data collection strategies and analysis techniques. Through purposive sampling, transferability was increased.



Since the study was conducted in rural secondary schools from the same circuit, the findings can be transferrable to other homogenous settings in other rural schools as they may experience the same or similar social problem as obesity that impact on learners' academic performance.

#### **4.14.3 Dependability**

Dependability refers to the stability of research findings over time (Trimmer, 2020). Dependability of the results denotes to the idea that another researcher would find similar results or similar patterns would emerge. Dependability is the strategy that can be used to ensure that one study is replicable and adequate to establish future studies. This involves the way in which the results of a study reflect the views of participants rather than the biases and perceptions of the researcher. This may need the participants to assess the evaluations, interpretations and recommendations of the research to ascertain the constancy of data (Korstjens & Moser, 2018). This study ensured the dependability of the findings through instituting an audit trail. I did this by way of taking stock of the initial plans and road map for the research from the philosophy guiding the research to the reporting of findings. I had to account for the type and sizes of samples for the study, the data collecting instruments, the items included in the questionnaire and interview schedules, and techniques of reporting findings regarding the topic under study.

#### **4.14.4 Confirmability**

This is extent to which the results of a study can be confirmed by other investigators (Korstjens & Moser, 2018). It establishes whether the data collection is free from the researchers' biases and interpretation of it are not figments of the researcher's imagination but rooted in the data. Chauvette, et al. (2020) contend that confirmability involves the degree of neutrality of the findings. This reflects the congruency of data regarding accuracy, relevancy and meaning. The use of member checking and verbal excerpts in the reporting of findings ensured confidentiality of the research results. After the conduct of interviews with selected participants and the transcription of data, I went back to my sources of data to verify the correctness of information. This required participants to read the transcriptions to confirm that the

written information is a true reflection of their views, opinions and ideas. This was done to solicit an audit trail on raw data (field notes and audio/cellphone recordings) collected from the field.

#### **4.15 Ethical Considerations**

They are important in every research. Rubin and Rubin (2008) explain how institutions of higher learning, are expected to review the research proposals of post graduate students and staff members before they embark on certain investigations so that such endeavours are ethically sound and effective. It is after permission has been granted that the process can resume.

For this study, the following ethics were considered:

##### **4.15.1 Permission to conduct research**

Permission to conduct research was obtained from the following structures: University of Zululand Ethics Committee and I wrote letters to the Vhembe District Department of Education and Principals of the sampled rural secondary schools to ask for permission to conduct research under their jurisdiction as well as participants (teachers, parents and learners). The ethical clearance certificate from University of Zululand Ethics Committee accorded me the opportunity to proceed to the field to collect both qualitative and quantitative data.

##### **4.15.2 Informed consent**

In this study, participants were informed about the aim of the research, what it entails and what role they were playing. In cases of minor respondents or learners with educational challenges, informed assent and or consent was designed so that it could be signed either by the legal guardian or parents to ensure the right to participation is obtained. Informed consent refers to the participant's agreement to take part after being made fully aware of any risks involved and understanding the rights they hold (Trimmer, 2020; Teddlie & Tashakkori, 2009).

Respondents and participants were given enough information (full disclosure) about the study as nothing was hidden to them if it entails the study. School learners are

indeed minors who cannot consent to the voluntary participation in the study. In this regard, a special written assent form was designed for parents of children who were taken part in the study to agree that their children be part of the study. The signing of the assent was done to protect minor respondents from emotional harm and participants were informed of the purpose of the study and their willingness to participate and have the right to withdraw partially or completely from the study. Participants were not forced to participate in the study through any of the following ways; undue influence, misrepresentation, threat or promise of payment. At the end of the assent or consent form, participants were asked to sign the form thereby confirming their consent to take part in the study. This was done to ensure that the respondents understood what they are agreeing to; that they were not consent to be respondents by means of any manipulation, coerced into participating in the study but their own will and consent based on clear understanding of the objectives of the study.

#### **4.15.3 Avoidance of harm to participants**

The other ethical consideration which is vital to research is the avoidance of harm to participants. Leedy and Ormrod (2010) aver that the study which concerns human beings should comply with the general rule of thumb. This states that the risk individuals encounter through participation in a study should not exceed that which is experienced in execution of day-to-day activities. In this regard, no research participant was subjected to physical, psychological and emotional harm, which are fundamental rights during their participation in the research. For this study, no respondents were subjected to unusual stress, embarrassment or any amount of psychological discomfort. Through anonymity and confidentiality, respondents were protected from possible harm and risks.

I avoided inflicting any psychological harm by taking careful considerations in the phrasing of questions. It entailed being sensitive when asking questions and other issues discussed during an interview session through avoiding asking sensitive questions (Mouton, 2014). I ensured avoidance of harm through making sure that all the participants were informed of the contents of the interview before its commencement. The interview sessions were conducted in offices where the

participants were free and comfortable to avoid any emotional or physical discomfort.

#### **4.15.4 Right to privacy and confidentiality**

Leedy and Ormrod (2012) state that the participants' right to privacy should be respected in any study. Their responses or behaviour in, maybe, an interview session should not be disclosed to other people. In this study, respondents' responses were treated with utmost confidentiality. The respondents remained anonymous. This was spelt out on the cover page of the research instrument. Participants and respondents were assured that their identities, the names of their schools and their responses were not mentioned or revealed in this research study, participants and respondents' information was treated with utmost confidentiality which was maintained throughout the research. Confidentiality is a promise that all participants and their identity were not identified or presented in identifiable form (Trimmer, 2020; Sapsford & Jupp, 2006).

Similarly, McMillan, and Schumacher, (2011) define confidentiality as ensuring that identifying information that could be used to link respondents to their responses is kept private from public. Data gathered from the participants was kept out of the public domain to maintain their anonymity and confidentiality. In this study, no participant's name was written on the responses, instead pseudonyms were used. Participant's information was also kept in the cupboard under lock and key on a computer with a secret password so that no one would access it without the participant's permission. This implies that even a research report, oral or written should be presented in a manner that protects the anonymity of research participants. Codes such as (PT1-PT5 and PL1-PL5) were used in the reporting of findings to avoid disclosing the identities of the respondents.

#### **4.16 Limitations of the study**

Because of the sensitivity of the topic, some participants felt uncomfortable in answering some research questions because they were not sure where the information will be taken to.

This was mitigated through assuring them that no personal identity was going to be attached to any research finding and that the collected data would be used only for the purpose of the study. It was also possible for wrong interpretation of questions on the impact of obesity on learner academic performance in rural secondary schools in Mvudi circuit of Vhembe District, particularly resulting from the use of primary sources such as a questionnaire. The piloting of the questionnaire items was done to clarify issues, identify flaws and avoid ambiguity in the formulated items. Some learners who were victims of psycho-social bullying due to their obesity may feel offended or experience emotional harm during data collection process.

To alleviate any possible harm to learners, they were briefed prior to distributing questionnaires on the purpose of the study and appraised that the focus was to improve the circumstances of such learners, including academic performance. The study is limited to learners in rural government secondary schools and may come from lower family income classes and results may not be applicable to learners in private independent school setting. Analysing and interpreting qualitative data was time consuming as it included converting audio recorded interviews into transcribed text.

#### **4.17 Intended contribution to the body of knowledge**

I intended to hold workshops with parents and teachers. Engage in media talk shows to alert the community about the effects of obesity. This would also assist learners to have knowledge about the importance of nutrition, healthy lifestyle and healthy eating habits and the effects of obesity. It would contribute in terms of learning and life as a whole. The findings would help learners, parents, community members and the Department of Basic Education on the impact of childhood obesity on academics. The study will provide learners with the knowledge required to live life full of options to consider for better life free from overweight and obesity as it has the capacity to impair academic outcomes among learners.

#### **4.18 Conclusion**

This chapter discussed the research methodology that the researcher chose for this investigation. Aspects that were defined and discussed in depth included the target population, sampling process and or procedures, selected samples, sample size, research instruments, data gathering procedures, ethical considerations and data analysis. The sampling procedures were clearly explained, indicated all respondents involved in the study and how they were selected. The next chapter focuses on data presentation, interpretation, and data analyses for this study.

## **CHAPTER 5**

### **DATA PRESENTATION, INTERPRETATION AND ANALYSIS**

#### **5.1 Introduction**

Chapter 4 presented and discussed the research design and methodology used in this study. It justified the use of mixed methods design as it related to the population of study, sampling procedures, the sample as well as the methods of collecting data. Ethical principles and data analysis procedures were tackled.

This chapter presents the findings from the data collected from both strands. In the quantitative strand, Grades 10 and 11 learners responded to self-designed close-ended questionnaires and the qualitative face-to-face interviews, observations and discussions were used to collect data from teachers and learners. The teachers and the learners were the sources of data to address the research objectives, namely to assess the prevalence of obesity among secondary school learners, identify the causes of obesity among rural secondary school learners, and ultimately determine the effects of obesity on learner academic performance in rural secondary schools.

The data from the participants were presented and analysed in response to the research objectives where verbatim transcriptions of recorded audio interviews were done. Verbatim quotations from the participants are presented to scaffold the findings from the literature reviewed on obesity and its impact on academic performance. Extractions of verbatim quotations from teachers' participation are indicated as P1 to P5 (P1; P2; P3; P4; P5;) and for learners' participation these are indicated as PL1 – PL5 (PL1; PL2; PL3; PL4; L5) to uphold the disclaimers on anonymity and confidentiality.

## 5.2 SECTION A: BIOGRAPHICAL INFORMATION

The biographic data is critical for this research study and provides information regarding the selected participants. This biographical information consists of fundamental aspects of the population inclusive of gender, ages, grades and location of schools. This component clarifies the type of individuals that participated in the research and how their personal characteristics influence the findings of the study.

**Table 5.2.1 Biographical information of the respondents**

<b>Variables</b>	<b>Frequencies</b>	<b>Percentages</b>
<b>Gender:</b> Males	56	45
Females	69	55
<b>Total</b>	<b>125</b>	<b>100</b>
<b>Age:</b> 13-15 years	50	40
16-18 years	55	44
19-21years and over	20	16
<b>Total</b>	<b>125</b>	<b>100</b>
<b>Grade:</b> 10	89	71
11	36	29
<b>Total</b>	<b>125</b>	<b>100</b>

### 5.2.2. Gender

The majority (55%) of the respondents were females as compared to males at 56(45%). The consideration of gender aspects is critical to ensure the findings of the study are not contaminated by gender bias. This may suggest that more females were interested in being part of the sample as obesity is a thorny issue to them as they experience pubertal adolescence. During adolescence stage, girls tend to be more roundish and have more fatty tissues. This makes them prone to obesity and



its consequences on academic performance. Adolescence also marks the stage at which girls become more concerned about the shape and sizes of their bodies.

### **5.2.3 Age Distribution of the Respondents**

The majority (44%) of the respondents were between the age group 16 to 18 years, and (40%) were aged between 13 to 15 years. Only 16% of the respondents aged between 19 to 21 years and over took part in the study. This age group is too overaged for Grades 10 and or 11. This may suggest that 20 participants at the ages between 19 to 21 have repeated the grades. This may suggest that age and body weight have negatively impacted on their academic performance which led to grade retention.

### **5.2.4 Grade**

The respondents who took part in the study were learners from rural secondary schools currently in Grades 10 (ten) and 11 (eleven). The table above shows that there were more respondents from Grade 10 at (71%) than from Grade 11 at (29%). This may suggest that Grade 10 learners were more interested in being part of the study sample than grades 11 learners. This was also confirmed by a participant from Grade 10 who volunteered to be interviewed due to being the victim of bullying, discrimination and teasing by his classmates. The implication is that efforts to mitigate the prevalence and effects of obesity among learners should be targeted at those in Grade 10, as shown by the enthusiasm of such learners to participate in the study.

## **5.3 Section B: IMPACT OF OBESITY ON LEARNER ACADEMIC PERFORMANCE IN RURAL SECONDARY SCHOOLS**

This section provides an integrated analysis and interpretation of quantitative and qualitative data obtained from the survey questionnaires and interview schedules. The issues covered include the prevalence of obesity in rural schools, causes of obesity among learners in rural secondary schools, effects of obesity on learner academic performance, and perceptions of learners on obesity. Obesity is of particular concern because of its potential physiological and psychological consequences on academic attainment of learners.

## 5.4 The prevalence of obesity in rural secondary schools

This segment presents the quantitative and qualitative results on the impact of childhood obesity on learner academic performance in rural secondary schools, inclusive of the view that obesity is prevalent among learners in schools, obesity is higher in females than males, there is an increase in obesity among learners, obesity causes hypertension, learners in South Africa are at risk of obesity, obesity increased between 2010 and 2017, technology limits participation in sports and most learners do not meet the required levels of physical activity, COVID 19 related mitigation regulations such as quarantine and lockdown worsen obesity.

## 5.5. Obesity prevalence among learners at school

This survey item sought participants to indicate their responses pertaining the prevalence of obesity among learners. This is represented in Table 5.5

**Table 5.5** Prevalence of obesity among learners at school

Valid	Frequency	Percentage
Strongly Agree	92	74
Agree	18	14
Neutral	10	8
Disagree	3	2
Strongly Disagree	2	2
<b>Total</b>	<b>125</b>	<b>100%</b>

Table 5.5 shows that 110 (88%) respondents strongly agreed and agreed with the statement that obesity is prevalent among learners. This idea is not supported by all as 5 respondents, constituting 4% of the total sample disagreed with the statement that obesity is prevalent among learners while 8% were neutral and this could be attributed to a lack of knowledge and misconception by the sample in the study. This study confirms the prevalence of obesity among learners. The qualitative findings corroborated the results from the quantitative data, in indicating the prevalence of obese learners in secondary schools. Two participants said:

*PL4: I have overweight... mmmm... very big than my classmates...*

*P2: In 2005, in the whole school we had few learners who were big but now more learners are becoming fat, mostly among girls.*

These vignettes from the participants confirm the prevalence of obesity in schools. This is supported by literature which states that obesity is highly prevalent among South African adolescent learners in recent years, and a progressive increase is noticeable in the incidents from 29.3% to 36.5% in both urban and rural settings (Okeyo, Seekoe, de Villiers, Faber, Nel, & Steyn, 2020; Villamor, Urassa, Petraro, Hunter & Fawzi, 2014). This implies that stakeholders should take cognizance of the presence of obesity among learners and nurture appropriate attitudes and practices to ensure the performance of learners is improved despite the incidence of obesity in schools.

**Table 5.6:** Obesity is higher in black South African females than males

Valid	Frequency	Percentage
Strongly Agree	53	42
Agree	47	38
Neutral	11	9
Disagree	8	6
Strongly Disagree	6	5
<b>Total</b>	<b>125</b>	<b>100%</b>

Respondents at 100(80%) agreed that the prevalence of obesity is higher among black South African females than males. This is constituted by 53 (42%) who strongly agreed and 47(38%) that agreed. There was a tally of 11(9%) respondents that were neutral, probably due to lack of requisite information regarding the nature of obesity. 14(11%) respondents disagreed that the prevalence of obesity in South Africa was higher in black females than males. This category was composed of 8(6%) respondents that disagreed and 6(5%) who strongly disagreed. The findings corroborate some studies (Negash, Agyemang, Matsha, Peer, Erasmus, & Kengne, 2017; WHO, 2007) which show that the prevalence of obesity in South Africa is more in black females than males particularly those coming from low income families. Tamara (2010) found that overweight and obesity was more prevalent in adolescent girls than in adolescent boys.

Literature further shows that gender is an important factor in obesity as highlighted by Kinge, Strand, Vollset and Skirbekk (2015). This is further confirmation that obesity is prevalent in schools, and more so among adolescent girls in secondary schools. It is at this stage that they experience pubertal hormonal surge and growth spurt which negatively affect their performance in school.

Qualitative analysis supports the results from the quantitative data in showing that obesity is common among black females than males. When asked to indicate whether obesity is prevalent among females than males, one participant submitted the following:

*(P5): "Both boys and girls, both of them are susceptible to obesity."*

Similarly, another participant added:

*(PT2) "...in fact, big in both boys and girls but I think mostly in our girls".*

While there were some participants who concurred, that obesity occurs in both males and females, a majority viewed the condition as more prevalent in females than males. This may imply that when most girls are obese, they are more vulnerable to teasing, bullying and social marginalisation, aspects which cause them to hate school and therefore culminate in grade retention.

**Table 5.7:** Plateauing prevalence of physical inactivity and obesity causes academic underachievement

Valid	Frequency	Percentage
Strongly Agree	52	42
Agree	43	34
Neutral	8	6
Disagree	12	10
Strongly Disagree	10	8
<b>Total</b>	<b>125</b>	<b>100%</b>

The responses show that 95(76%) of the total sample agreed with the statement that the high prevalence of physical inactivity and obesity negatively impact on academic performance of learners. This is made up of 52(42%) who strongly agreed and 43 (34%) that agreed. 8(6%) remained neutral on the issue while 22(18%) of the respondents disagreed with the statement, constituting 12(10%) that disagreed and

10(8%) who strongly disagreed. The qualitative data generally corroborated the findings from quantitative analysis in showing an increase in physical inactivity and obesity causing academic underachievement among school learners. PE in schools has been allocated lesser time than the core subjects which make it less important for the learners. One participant made the following submission:

*PT1: It is frustrating to find that learners do not want to perform and exercise during lessons. They are just lazy... may be is because of freedom...after eating they dose and slumber in the classroom. When these learners eat, and become sedentary, they become obese and very fragile*

*PL3: It frustrates to participate in PA during hot sunny days as I feel very tired. When I'm there I feel socially excluded as my classmates do not want me to be in their group... you can see that I'm...not like others"*

The emerging picture is that obese learners are physically inactive despite their body fatness. Both the quantitative and qualitative findings corroborate Kantomaa, Stamatakis, Kankaanpaa, Kaakinen, Rodriguez, Taanila, & Tammelin, (2013) who aver that compromised motor function among obese adolescents can lead to obesity, physical inactivity, and low cardiorespiratory fitness, all of which are, in turn, associated with academic underachievement. Literature indicates that physical inactivity predicts poor academic performance while an increased physical activity is positively associated with improved academic performance.

**Table 5.8 Obesity is associated with hypertension.**

<b>Valid</b>	<b>Frequency</b>	<b>Percentage</b>
Strongly Agree	41	33
Agree	43	34
Neutral	16	13
Disagree	25	20
Strongly Disagree	7	6
<b>Total</b>	<b>125</b>	<b>100%</b>

Respondents were requested to indicate their views on whether obesity is associated with hypertension. Table 5.8 indicates that 84 (67%) of the respondents of the sample agreed with the statement that the prevalence of obesity is associated with an increased risk of developing hypertension. This is composed of (41) 33% that strongly agreed and 43 (34%) who agreed. 16 (13%) respondents were neutral on the statement due to lack of information on childhood obesity. 25 (20%) respondents disagreed with the statement. These results imply that an elevated BMI is associated with an increased risk of developing hypertension. The results are consistent with Falkner (2017) who avers that hypertension occurrence in childhood is basically a consequence of the childhood obesity epidemic.

Qualitative findings concur with quantitative findings that obesity leads to hyperactivity in learners. This hyperactivity or high blood pressure exists among a plethora of other health challenges which beset children at school.

One respondent indicated that “...they may also have disease[s] like this high blood pressure” (PT3), while another one said

“Obesity can cause blood pressure” (P1).

Reilly and Kelly (2011) established that childhood obesity heightens the risk of diabetes, premature death, hypertension, asthma, stroke, and diseases of the ovaries. Voils, Pendergast, Hale, Gierisch, Strawbridge, Levine, and Shaw (2021) posit that obese learners can suffer from at least one of the diseases, inclusive of high blood pressure, diabetes, and cardiovascular disease which negatively affect academic performance.

**Table 5.9** Urbanisation and sedentary lifestyle expose learners to the risk of obesity.

Valid	Frequency	Percentage
<b>Strongly Agree</b>	<b>61</b>	<b>49</b>
<b>Agree</b>	<b>34</b>	<b>27</b>
<b>Neutral</b>	<b>16</b>	<b>13</b>
<b>Disagree</b>	<b>8</b>	<b>6</b>
<b>Strongly Disagree</b>	<b>6</b>	<b>5</b>
<b>Total</b>	<b>125</b>	<b>100%</b>

Respondents were requested to indicate their responses regarding their knowledge on whether learners are at risk of obesity due to sedentary lifestyle caused by urbanisation in South Africa. The responses indicate that 76% of the sample agreed with the statement that learners in South Africa are at a great risk of obesity due to sedentary lifestyle as a result of urbanisation. This confirms results in a study by Choukem, Tochie, Sibetcheu, Nansseu, & Hamilton-Shield, (2020) who view overweight and obesity as an emerging problem which stems from increasing urbanisation and westernised lifestyles which in turn has led to the emergence of a nutrition transition characterised by a higher calorie nourishment. This is comprised of 49% of those who strongly agreed and 27% that agreed. 16 (13%) respondents were neutral. This group of respondents may have been uncomfortable in answering the question or unsure if learners in South Africa are at any risk of obesity. 6% strongly disagreed and another 5% disagreed, giving a total of 11% of respondents that disagreed with the statement. This generally indicates that learners in South Africa are at a great risk of obesity caused by urbanisation and inactive lifestyle which can negatively affect academic attainment of learners.

Qualitative analysis showed that learners in South Africa are at risk of experiencing obesity. This emanates from their life styles, inclusive of eating habits and physical inactivity. The presence of shops and eating outlets which sell fast foods influence learners to buy and eat oily foods which foster obesity. Two participants said:

*(P5): Remember now that we have got Thavhani Mall, we have got shops there which have got fast instant foods, pizzas and tuck-shops...selling Russian sausages and hot dogs, whatever. This is what our learners are taking most of the time.*

*(PL1): ...we South Africans we just sit at home and not doing any movement, [which] is a bad thing. I enjoy watching TV and [do] not go to my friends' home as I sometimes feel unwelcomed, especially when she has her other friends. I can see that she ignores me...*

The finding of this study suggests that learners in South Africa are at high risk of obesity which is consistent with the results of a study by Puoane, Steyn, Lambert and Mbananga (2012), which reports that about 40% of young people are obese in

South Africa. Kantachuvessiri (2005) also avers that an increase in cases of obesity may be swifter in developing nations compared to the developed world where malls such as Thavhani have got many fast-food outlets.

**Table 5.10** Increase in obesity between 2010 and 2017

Valid	Frequency	Percentage
<b>Strongly Agree</b>	<b>37</b>	<b>30</b>
<b>Agree</b>	<b>28</b>	<b>22</b>
<b>Neutral</b>	<b>16</b>	<b>13</b>
<b>Disagree</b>	<b>28</b>	<b>22</b>
<b>Strongly Disagree</b>	<b>16</b>	<b>13</b>
<b>Total</b>	<b>125</b>	<b>100%</b>

Participants were asked to rate their responses on whether obesity increased between 2010 and 2017. 30% of respondents strongly agreed and 22% agreed that obesity increased between 2010 and 2017. This constituted a total of (65) 52% respondents who generally agreed. Only 16 (13%) respondents were neutral. These respondents may not have noticed this surge in obesity, or unsure if the prevalence of obesity increased between 2010 and 2017 among learners in South Africa. On the other hand, 22% of the respondents disagreed and 13% strongly disagreed, making 35% of the respondents who generally disagreed with the statement. Therefore, most respondents agreed that the prevalence of obesity increased in both genders among learners in South Africa from 2010–2017.

Findings of the study show that obesity increased among learners but there was no agreement on the period between 2010 and 2017. It is clear in literature and statistics that an increase in the number of obese learners was witnessed in the successive enrolment of learners. A participant said:

*PT5: In fact, if we [can] look at the learners that we have in the learner enrolment, I think that this year, in fact every year, it is becoming more than the previous year. We are getting more learners who are bigger than the normal expected size of their grade.*

Villamor, Urassa, Petraro, Hunter & Fawzi, (2014) suggest that obesity is noticeable in developed nations, but has progressively increased in developing states, inclusive



of South Africa. However, Kafyulilo (2006) argues that the prevalence of obesity in South Africa was noticeable among learners from 2002 to 2008. This implies that there is an increase in obesity among learners in South Africa, even though there is incongruence between this finding and the extant literature.

## **5.6 THE CAUSES OF OBESITY AMONG LEARNERS IN RURAL SECONDARY SCHOOLS**

This section focused on the causes of obesity among learners in rural secondary schools in Mvudi circuit of Vhembe District.

**Table 5.11 Technology limits learners' participation in physical activities.**

Valid	Frequency	Percentage
Strongly Agree	56	45
Agree	41	33
Neutral	10	8
Disagree	11	9
Strongly Disagree	7	6
Total	125	100%

Most of the respondents 97(78%) agreed with the statement that technological advancement limits learners' opportunity to participate in sport. This was made up of 34% respondents who strongly agreed and 33% that agreed. Only 10 (8%) respondents were neutral on the statement. 6% of the respondents strongly disagreed and 14% disagreed, making up total of 18 (15%) of the total sample that disagreed with the statement that technological advancement limits learners' opportunity to participate in sport. Therefore, most of the respondents (78%) generally agreed that technological advancement limits learners' opportunity to participate in sports. 56(45%) strongly agreed and 41(33%) agreed. This is so because learners spend a lot of time playing computer games and watching technology programmes which inhibit physical participation. This ensuing situation is conducive for overweight and obesity. The findings corroborate Méndez, Ruiz-Esteban, & Ortega, (2019) who observed that declining participation in sports and physical activity are the main causes of sports bullying and health crisis, especially among the youth and children. This seems to be related to the growing prevalence of 'unhealthy' diets, declining levels of daily energy expenditure and an increasing

preference for engaging in sedentary leisure activities influenced by the new media technologies. An increase in greater physical activity increases the quality of life associated with good health and positive self-esteem.

Findings from qualitative data buttressed the results of quantitative analysis, in presenting the use of technology as an impediment to the participation of learners in sports. Children spend most of their time either watching TV or playing games on computers. This period of physical inactivity is further compounded by the fact that currently, most children are even driven to and from school in ways which hamper active physical activities. This fosters the development of obesity and its negative effect on academic performance. Obese learners have low cognition concentration in school work as they live sedentary type of lifestyle. One participant said:

*PT4: I think that these days you know that almost every household has got a TV, so most of our children after school, they go sit in front of a TV, they don't have activities that they are doing. They suffer from social media addiction. You will find that they are on Facebook, twitter, WhatsApp, Instagram... These children are hooked to social media... They have addiction for the internet. They are always seated in front of the screens.*

*PT5: Excessive eating habits and binge eating and not taking part in physical activities, watching TV the whole day and not partaking in activities where you go out with others to have fun such as playing soccer or netball outside cause fatness condition. Some of these learners eat too much... You may find that the food portion is very big for one person. During break time, we buy food in groups so that we can have enough even though we eat too much pap and fried meat. This type of food is just delicious...*

*PT4: They do nothing when they get home they only sit and watch TV. They don't do other activities that can lead them to burn the calories, that they have taken in. They just binge eat to enjoy food even if they are not hungry... they are used to learned cues of eating due to the conditioning*

*at school. When I arrive home after school, I watch TV and eat. I enjoy watching TV and eating simultaneously.*

Most literature regarding sedentary behaviour indicates that it is only screen time which is associated with obesity among learners (Falbe et al., 2013). Learners tend to shift from active participation to electronically controlled games (Gavin, 2012). Technological changes and the dramatic shift in lifestyles constitute risk factors for the development of obesity (Tremblay, LeBlanc & Kho, 2011). It was established through research that long term screen viewing time is widely recognised as a major contributor to the development of obesity and is also associated with decreased physical fitness, self-esteem and academic performance, and increased aggression in children (Wachira, Muthuri, Ochola, Onywera & Tremblay, 2018). The implication for academic performance is that obese learners have limited time doing homework, studying, and reading for leisure but engaged in higher levels of TV viewing which may potentially lead to poorer academic performance as they have poorer muscular endurance and flexibility regarding participation in activities which require physical and mental abilities. Such learners are prone to physical and cognitive fatigue which are critical ingredients for school performance. The effect is that they would retard their colleagues in study and academic progress.

**Table 5.12** COVID 19 related lockdown causes obesity and education underperformance

Valid	Frequency	Percentage
Strongly Agree	53	42
Agree	51	41
Neutral	11	9
Disagree	5	4
Strongly Disagree	5	4
<b>Total</b>	<b>125</b>	<b>100%</b>

Respondents were asked to give their responses on whether COVID 19 related lockdown restrictions cause learners to underperform at school. Figure 5.4.2 shows that 104 respondents, constituting 83% of the participants agreed with the

questionnaire item that learners perform poorly at school due to lockdown restrictions as they are not allowed to attend school. This figure is comprised of the 53 (42%) who strongly agreed and (51) 41% that agreed. Only 11 (9%) respondents were neutral. There were 5 (4%) respondents who strongly disagreed and another 5 (4%) disagreed, making up 10 (8%) of respondents that generally disagreed with the statement. The findings corroborate those of Smith, Fu, & Kobayashi, (2020) who aver that children experiencing obesity have a higher risk for depression because of stigma and isolation as means to mitigate the spread of COVID19 and report more corona virus related stress (Thaker et al., 2020). These are people who and eat in response to stress to a greater degree than normal weight peers (Miller et al., 2019). Obese children resort to emotional eating to deal with stress and out of school time which has been associated with weight gain, especially for children living in poverty, isolation, under-served communities and those with mental health issues (Vinkers et al., 2020) that profoundly cost their education (Rundle, Park, Herbstman, Kinsey, & Wang, 2020). Regression of academic progress is linked to time out of school, isolation from peers and face-to-face instruction by teachers and home-schooling discomfort (Van Lancker & Parolin, 2020).

COVID19 exacerbates health disparities, including childhood obesity, amongst vulnerable children which increases risk factors through increased stress level and decreased physical activity related to environmental, academic and social changes. Online education lacks the Physical Education class, recess time, and normal levels of active movement for the school-aged child and adolescent which negatively affect their academic outcomes. Isolated children at home cannot access environments that offer opportunities for physical activity. Lengthy times at home contribute to children developing psychosocial issues, boredom and body image disorder (Dubey et al., 2020), and loneliness. The child's sense of security is exacerbated by social isolation which threatens the pre-existing obesity related anxiety or depression that foster poor academic outcomes.

The qualitative results strengthened the quantitative results as participants have this to say:

*(PT5) We are really in trouble as these kids don't read at home. They just eat and watch TV or sleep or play games. How are they going to pass since we are not*

*teaching them? This is just the first quarter of the year...mmm. This out of school stay away is badly affecting education.*

*(PT2) added: I think they cannot make it academically. We taught them few contents (sic).*

**Table 5.13 Obesity causes health problems and underperformance**

<b>Valid</b>	<b>Frequency</b>	<b>Percentage</b>
Strongly Agree	48	38
Agree	56	45
Neutral	11	9
Disagree	5	4
Strongly Disagree	5	4
<b>Total</b>	<b>125</b>	<b>100%</b>

Respondents were asked to give their responses on whether obesity causes health problems and poor performance at school. The majority of the respondents at 104(83%) agreed that obesity causes health problems and underperformance among learners. This is mediated through absence when visiting doctors for medical reviews and ill-health can cause them to stay home. Only (11)9% were neutral about the item and only (10)8% disagreed with the statement. The findings confirm those established by Adom, Puoane, De Villiers, & Kengne, (2017); Twig, Zucker, Afek, Cukierman-Yaffe, Bendor, Derazne, & Tirosh, (2020) who aver that obese children are at an increased risk of developing hypertension, heart problems, cancer, high cholesterol, orthopaedic problems, respiratory difficulties, fatty liver disease and type 2 diabetes. The findings also revealed that academic success is strongly linked with children's health.

Qualitative findings also established that:

*(PT5) /(PT1) These children are very weak and floppy. They are always sick and don't attend school properly. Their absenteeism affects their academics. Childhood obesity is associated with various immediate and long-term adverse health consequences and leads to various social and psychological problems such as low self-esteem, body embarrassment, bullying and social exclusion.*

This implies that when they are sick, effective learning cannot occur as all the major body domains influence each other. A healthy body is required for learning to take place. When these learners are sick, they cannot concentrate and should seek medical care and this essentially means absence from face-to-face teaching between teachers and learners.

**Table5.14 Poor nutrition intake linked to obesity hampers academic performance.**

<b>Valid</b>	<b>Frequency</b>	<b>Percentage</b>
Strongly Agree	66	53
Agree	49	39
Neutral	2	2
Disagree	3	2
Strongly Disagree	5	4
<b>Total</b>	<b>125</b>	<b>100%</b>

The majority of the respondents 115(92%) agreed that there is a strong relationship between obesity, food and academic performance. Only 2% was neutral while 8(6%) disagreed that poor nutrition intake impedes academic performance. Health-related factors such as hunger, poor nutrition intake, abuse, and chronic illness can lead to poor school performance.

The findings confirm (Maniaci, La Cascia, Giammanco, Ferraro, Palummo, Saia, La Barbera, 2021; Alswat, Al-Shehri, Aljuaid, Alzaidi, & Alasmari, (2017) who contend that healthy behaviours are associated with academic achievement in adolescents, which suggests that the consumption of sugary sweetened beverages, poor nutrition intake and skipping of breakfast might lower cognitive function and, in turn, the likelihood of grade retention in school. This may mean that SNP introduced by the government was meant to improve academic performance. Health-risk behaviours such as poor nutrition intake, substance use, violence, and physical inactivity are consistently linked to academic failure and often affect students' school attendance, grades, test scores, and ability to pay attention in class, a change in lifestyle habits and a replacement of traditional food with Western-style fast food causes obesity.

Qualitative findings strengthen the quantitative findings where the research participants said the following:

(PT2): *When these children eat what they want and call palatable and inexpensive fatty junk foods, sweetened fizzy drinks and fries, they suffer stomach aches, become moody and perform badly in mathematics.*

PL4: *I enjoy eating sweets, fried meat, cake and cold fizzy drinks as they are delicious....*

PL1: *Yaaaah I also enjoy eating that as this type of foods are even readily available always [sic].*

## 5.7 The effects of obesity on learner academic performance

This section analyses the views of participants on the impact of obesity on learner academic performance. These include the fact that learners can suffer from health (physiological) consequences, psycho-social complications and economic consequences that negatively impact academic performance.

### 5.7.1 Learners can suffer from obesity related illnesses

Respondents were asked to give their responses on whether learners can suffer from obesity related illnesses. The results are displayed in Table 5.15.

**Table 5.15 Learners can suffer from obesity related illnesses**

Valid	Frequency	Percentage
Strongly Agree	60	48
Agree	40	32
Neutral	7	6
Disagree	10	8
Strongly Disagree	8	6
Total	125	100%

Table 5.15 indicates that most of the respondents at 100 (80%) agreed that learners can suffer from obesity related illnesses.

This is constituted of 60 (48%) respondents that strongly agreed and 40 (32%) that agreed. Only 7 (6%) respondents remained neutral. 10 (8%) respondents disagreed and 8 (6%) strongly disagreed, giving a total of 18 (14%) respondents that disagreed with the survey item. The conclusion from the data is that learners experience obesity related illnesses. However, the results from interviews verified that obesity is related to diseases such as asthma, heart problems, cancer, diabetic challenges and juvenile hypertension. These diseases force learners to consult their doctors or ask for permission to go to the clinic and hospital for medical check-up, thereby missing out on the academic enterprise.

One respondent said “...*obesity is also an infection that makes you become asthmatic and have breathing problems* (P1). Other participants added:

PT3: *I think they might also have diseases like heart problems, diabetic sugar, they may also have disease like this high blood pressure as they easily faint when it is hot or when running.*

PT4: *Most of these fat learners are asthmatic, they are very weak and faint easily, become breathless or have shortness of breath. Their lungs are very weak...I suppose*

This confirmed Ottova et al. (2012), who aver that children can suffer from obesity related illnesses. This is also consistent with literature by Kelsey, Zaepfel, Bjornstad, and Nadeau (2014), which identifies the risks of obesity as inclusive of heart problems, fatty liver disease, diabetes, sleeping disorder, asthma, infertility and cancer. Obesity related illnesses subsequently lead to adverse academic outcomes through absenteeism and consulting doctors for medical reviews due to the poor health.

### **5.7.2 Obesity increases the risk of premature death**

Respondents were requested to indicate whether obesity increases the risk of premature death. The outcomes are shown on the table below.



**Table 5.16: Obesity increases the risk of premature death.**

Valid	Frequency	Percentage
<b>Strongly Agree</b>	46	37
<b>Agree</b>	50	40
<b>Neutral</b>	10	8
<b>Disagree</b>	9	7.2
<b>Strongly Disagree</b>	10	8
<b>Total</b>	<b>125</b>	<b>100%</b>

Table 5.16 shows that 96 (77%) respondents generally agreed with the statement that obesity increases the risk of premature death. This is comprised of 46 (37%) respondents who strongly agreed and 50 (40%) that agreed. Only 10 (8%) respondents were neutral regarding the survey question. On the other hand, 9 (7.2%) respondents disagreed and 10 (8%) strongly disagreed that obesity raises the risk of premature death. In total, 19 (17.2%) respondents basically disagreed with the statement. The broad position of the respondents is that obesity makes learners susceptible to premature death.

The findings endorse the study by Lindberg, Danielsson, Persson, Marcus & Hagman, (2020); Chen, Ye, Zhang, Pan, & Pan, (2019) who found out that overweight and obese children under 18 years of age have been linked to an increased risk of premature mortality from middle adulthood onward. This was due to the persistence of obesity comorbidities such as cancer and heart disorders coupled with social segregation. Although participants articulated the diseases and challenges associated with obesity among learners, they did not mention that it leads to premature death which shows that they lack such knowledge.

The participants had this to say:

*PT3: Though the causes of deaths are not known to the two grade 10 learners, both were big and fat. We received information that one learner indicated that she was tired. She just wanted to have a nap when she arrived home. It was later found that she had died and no one knows what was the cause. Since the student was obese, maybe it is premature death.*

*PL5: I hate running or participating in PE especially when it is very hot. I once collapsed and felt as if I was running out of breath...I nearly died... I was rushed to the clinic and they gave me water and my whole body was splashed with water.*

Conette (2014) corroborates quantitative and qualitative data which shows that, in the worst of cases, obesity causes persistent health conditions and may even cause premature death among learners. WHO (2015) shows that 107,000 deaths out of the 571,000 that occurred in 2005 in Tanzania, were a result of chronic diseases which are related to obesity.

### 5.7.3 Obese learners are stigmatised in school

The outcomes of respondents were sought on whether obese learners are stigmatised in school. Their responses are depicted in Table 5.17 below.

**Table 5.17: Obese learners suffer stigmatisation in school**

Valid	Frequency	Percentage
<b>Strongly Agree</b>	63	50
<b>Agree</b>	29	23
<b>Neutral</b>	7	6
<b>Disagree</b>	16	13
<b>Strongly Disagree</b>	10	8
Total	<b>125</b>	<b>100%</b>

Table 5.17 indicates that 63 (50%) respondents strongly agreed that there is stigmatisation of learners in schools. 29 (23%) agreed with the statement, making up 92 (73%) respondents that generally agreed with the survey item. 7 (6%) participants were neutral. On the other hand, 16 (13%) respondents disagreed while 10 (8%) strongly disagreed that stigmatisation is recurrent in schools. The major finding is that learners encounter stigmatisation in schools. Qualitative data supported the results of quantitative analysis in ascertaining the stigmatisation of obese learners. It emerged that such learners are mocked, made fun of and jokes are fraught with insults pertaining to their body structures.

*(PL5): “Some will call me “tshibumba”, some will call me fatty –boom-boom which are the names that became like a stigma to me. While I was fat they used to call me names probably in Tshivenda, whereby they will say I was “Tshibumba”, which means a fat person and like a fat cook, which means “gwinya” in Tshivenda, because my body was covered with fats...*

*(PT6): Since they are overweight, then sometimes their peers laugh and make jokes about them and that can affect their social condition and educational outcomes. They used to make jokes about them, because they are too big. They even call them names like “tshibumba” “mama fresh”.*

*(PT3) Obese children are made fun of through name - calling as they are sometimes called “muri” which is associated with ‘big’ baobab tree.*

The big bodies of obese learners attract name calling which consequently affect their socio-educational conditions. The findings confirm studies by Pont, Puhl, Cook & Slusser, (2017); Janssen et al., (2004); Griffiths et al., (2006); Puhl & Latner, (2007) who found out that overweight and obese children are more likely to be victims of aggression than normal size peers and are frequently exposed to peers' intentional negative actions that are physical (e.g., kicking, pushing, hitting), verbal (e.g., being teased, name calling, derogatory remarks,) or relational (e.g., being ignored or avoided, social exclusion, being targets of rumours. It was confirmed in this study that bullied obese children avoid school or playgrounds, thereby decreasing the quality of their educational attainment and recreational experiences due to the fear of being ridiculed and develop “body embarrassment.” This frequent obesity related absenteeism can negatively impact on their academic achievement as it is undeniable that absenteeism places these children at risk for learning difficulties and failure and hinder academic attainment.

The study by Henderson, Hill, & Norton, (2014) confirms quantitative and qualitative findings that obesity may affect children's school attendance and academic performance through its detrimental impact on their physical and mental health. Obese children could disproportionately suffer from illnesses that result in absenteeism, being bullied, teased and are more likely to suffer from stigmatisation,

depression and lower self-esteem more than their normal weight counterparts. Some obesity victims are perceived as exhibiting some learning disabilities.

#### **5.7.4 Obese learners are prone to depression and anxiety**

Respondents were asked to give their responses on whether learners with obesity are prone to depression and anxiety. Their responses are presented in Table 5.18 below.

**Table 5.18 Obese learners are prone to depression and anxiety**

<b>Valid</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Strongly Agree</b>	58	46
<b>Agree</b>	34	27
<b>Neutral</b>	9	7
<b>Disagree</b>	18	14
<b>Strongly Disagree</b>	15	13
<b>Total</b>	<b>125</b>	<b>100%</b>

Table 5.18 indicates that the majority of the respondents 92 (73.6%) agreed that obese learners are prone to depression and anxiety. This figure is comprised of 58 (46%) respondents that strongly agreed and 34 (27%) that agreed. 9 (7%) respondents were neutral. 18 (14%) respondents disagreed and 15 (13%) strongly disagreed that obese learners encounter stigmatisation. The findings of the study suggest that when learners are obese, they fall victim to depression and feel anxious and stressed due to the treatment they receive from peers and teachers. This is in harmony with qualitative findings which suggest that obese learners tend to be deserted and isolated by friends, which further leads to stress and depression. The findings of the two strands confirm the study by Sanyaolu et al., (2019) who observes that obesity can massively impact on both physical and psychological health. Consequently, it is associated with several comorbidity conditions such as hypertension, hyperlipidaemia, diabetes, sleep apnea, poor self-esteem, eating disorders, body image disorder and even solemn forms of depression.

Two participants said:

P2: *The consequences will be... few friends or maybe no friends it can results in stress anxiety, it can also affect your mental health, yah it can also affect your academics.*

PT5: *I also think that they might also end up being depressed because they don't have friends or classmates to talk to. Other peers don't like them.*

Literature states that anxiety, depression, coexist in learners to cause low self-esteem, sadness and obesity which coalesce to explain an increase in low academic performance among learners (Richey, Brewer, Sullivan-Toole, Strege, Kim-Spoon, White, & Ollendick, 2019; Reeves, Postolache, & Snitker, 2008). This suggests that obesity can lead to depression and anxiety, while the reverse is also true: learners value social belonging which cushions them from the distress of isolation and rejection.

#### **5.7.5 Obese learners perform academically poor at school.**

The respondents were asked to present their responses on whether obese learners perform poorly at school compared to normal weight children. The results are presented in Table 5.19 below.

**Table 5.19: Obese learners perform academically poor at school**

<b>Valid</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Strongly Agree</b>	71	57
<b>Agree</b>	34	27
<b>Neutral</b>	6	5
<b>Disagree</b>	8	6
<b>Strongly Disagree</b>	6	5
<b>Total</b>	<b>125</b>	<b>100%</b>

Table 5.19 amply shows that 105(84%) respondents agreed that obese learners perform poorly at school when compared to their normal weight counterparts. Only 6 (5%) respondents were neutral, may be as a result of a lack of requisite information. 8 (6%) respondents disagreed and 6(5%) strongly disagreed, making up 14(11%)

respondents who disagreed that obese learners are found to perform poorly at school when compared to their normal weight peers. The persistent picture is that most respondents agreed that obese learners perform poorly at school than other normal weight children. Interviews with respondents affirmed this position by revealing that obese learners have a short attention span causing them to tire easily and sleep during lessons. They are unable to run during Physical Education due to their heavy bodies. The feeling of being belittled by peers creates fear in themselves such that they become timid in responding to questions in class. Two participants said:

*PT5: They have short attention span ...they can get tired before the end of the lesson and they do sleep because they are tired and when you want to do exercise with them you find that they are tired*

*PT3: They feel belittled and they cannot respond when the educator asks them question because they are afraid of being embarrassed, others will laugh at them and that affects their studies very bad)*

Qualitative responses also showed that there are some obese learners who are resilient to frustrations resulting from their body size and weight. They can work and excel in groups as well as motivate others to strive for quality outcomes.

However, another respondent said: *"But they are very few ...most of them are very poor academically"* (PL3).

Admittedly, the two strands of data highlight that obese learners perform poorly compared to their non-obese counterparts.

The findings support the study by Naticchioni, (2013); Alswat, Al-Shehri, Aljuaid, Alzaidi, & Alasmari, (2017) who observe that obese children achieved poor results in mathematics and reading tests when compared with their normal-weight peers, especially when those obese students did not consume breakfast they tend to perform poorly in the academic domain.

### 5.7.6 Obesity related teasing affect academic performance of obese learners at school

The study sought the views of respondents regarding the effect of teasing on the performance of obese learners. Table 5.20 presents the responses of the participants.

**Table 5.20** Obesity related teasing affects academic performance of obese learners at school.

Valid	Frequency	Percentage
<b>Strongly Agree</b>	44	35
<b>Agree</b>	54	43
<b>Neutral</b>	8	6
<b>Disagree</b>	7	6
<b>Strongly Disagree</b>	12	10
Total	<b>125</b>	<b>100%</b>

Table 5.20 shows that 44 (35%) respondents strongly agreed with the statement that teasing affects academic performance of obese learners. 54 (43%) agreed with the survey item. Altogether, 98 (78.4%) respondents generally agreed with the statement. 8 (6%) remained neutral. On the other hand, 7 (6%) disagreed and 12 (10) strongly disagreed, totaling 19 (16%) respondents that disagreed that teasing affects the academic performance of obese learners. The persistent stance is that teasing of obese learners impacts on their academic performance. This is in harmony with qualitative data which indicates that obese learners are teased by both their peers and teachers because of their body weight. Teasing makes them feel unsafe at school and even associate most interactions as intended to tease them which cause obese learners to avoid school that can negatively impact on their academic performance.

In qualitative interviews these respondents said:

*(PT3) "They tease each other. Just because another one is too big or over weight."*

(PT9) stated “...when people are talking to them, they don’t respond as they are always fearful of being ridiculed...they will think that this is just teasing.

This is further buttressed by the respondent who said:

(PL4) *They will call me by names, my teacher will tease me so I feel belittled and feel unsafe at school or in the classroom...I feel excluded... I’ll rather be staying at home, locking myself in my room and eating too much (emotional eating stress, showing emotional pains)*

This is supported by Aderinola, (2022); Jansen, Verlinden, Dommissie van Berkel, Mieloo and Raat (2014) who contend that obese learners are regarded as a population at high risk as they are victims of different forms of bullying and teasing such as verbal teasing, name calling, derogatory remarks, being made fun of, physical bullying such as hitting, and social bullying such as being ignored, excluded or avoided, rumour targets and cyber bullying which result in low self-esteem. This is sufficient evidence of the negative effect of teasing on learners’ academic performance as all these forms of teasing can cause the learner to drop out or be absent from school for most days.

#### 5.7.7 Obese learners have difficulty socialising with peers

**Table 5.21:** Obese learners have difficulty socialising with peers

Valid	Frequency	Percentage
<b>Strongly Agree</b>	60	49
<b>Agree</b>	27	22
<b>Neutral</b>	4	3
<b>Disagree</b>	10	8
<b>Strongly Disagree</b>	24	18
<b>Total</b>	<b>125</b>	<b>100%</b>

Table 5.21 illustrates that 87 respondents, constituting 71% of the total sample agreed that obese learners have difficulty socialising with their peers. This figure is comprised of 60 (49%) respondents that strongly agreed and 27 (22%) who agreed. Only 4 (3%) respondents were neutral. 10 (8%) respondents disagreed and 24 strongly disagreed, making a total of 34 (26%) respondents who disagreed that



obese learners have a difficult time socialising with their peers. The statistical analysis confirms that the majority of respondents are of the view that obese learners have a difficult time socialising with their peers due to their body fat.

Qualitative data fortifies this stance, indicating that learners with obesity have trouble socialising with peers who constantly undermine their normalcy as human beings.

One respondent said:

*PT3: "They undermine them at school. They don't think they are normal beings like any other person. Obese learners are mocked and joked about in ways that exacerbate their social conditions. It is usually at home that such learners are embraced and experience social acceptance."*

*PL3: I do not have friends...They just ignore me... I like to have friends who can assist me in mathematics and physical science.*

*PT2: Since they are overweight, then sometimes their peers make fun of them and that can affect their social condition. They used to make jokes about them, because they are too big... Some fat (obese girls and boys) are called mama or papa as they have difficulty fitting into classroom chairs and desks which causes physical and emotional discomfort, preventing fat students' educational achievement.*

*PT4: When we compare the learners from school and home background, they have a strong support base at home. Because the parents know that at school, they became isolated but while they are at home, they have got a very strong support from parents and siblings.*

The findings are corroborated by the contribution of Niehoff, (2009); Stevens, (2018) who indicate that obese learners have difficulties socialising with their peers because of fear of being stigmatised and social isolation. This indicate that obese learners experience hard times making friendship to the fat stigma attached to them. This peer rejection and social distancing styles deprives obese learners of the desired collaborative approach to learning, resulting in decreased academic performance as they are frequently stereotyped as ugly, stupid, mean and lazy.

### 5.7.8 Obese learners may think of committing suicide

**Table 5.22:** Obese learners may think of committing suicide

Valid	Frequency	Percentage
<b>Strongly Agree</b>	52	42
<b>Agree</b>	49	39
<b>Neutral</b>	8	6
<b>Disagree</b>	6	5
<b>Strongly Disagree</b>	10	8
<b>Total</b>	<b>125</b>	<b>100%</b>

Table 5.22 indicates that 101(81%) respondents generally agreed with the statement that obese learners report attempting to commit suicide. This number is composed of 52(42%) respondents that agreed and 49 (39%) that strongly agreed to the survey item. 8 (6%) respondents were neutral on the issue, may be owing to lack of information on the suicidal tendencies of obese learners. Furthermore, 6 (5%) respondents disagreed and 10 (8%) strongly disagreed with the statement. In essence, most respondents agreed that obese learners report attempts to commit suicide. Qualitative data strongly confirmed the quantitative data that ridiculed obese learners show the tendency and inclination of wanting to commit suicide as they look restless, agitated, anxious and depressed mostly. Insinuations of suicidal tendencies were evident in the data. Responses were awash with feelings of loneliness, alienation, frustration, humiliation, shyness and emotionally drained, which are catalytic of suicidal thoughts. Participants said:

*PT4: They might end up being alienated and they became lonely, when they go home again, they might stay in their rooms or just watch TV, continue eating because they cannot share this problem with anyone. They look like they are not ok mentally.*

*PT3: ...that learner can feel humiliated by her state. She cannot even interact with other learners as well and she is also shy and emotionally hostile, she will also be affected and even think of killing oneself.*

*PL4: I think of killing myself as no one loves me...when I move around the school premises everybody turn around, look and laugh at me.*

These findings corroborate Yu, Wu, Twayigira, Luo, Gao, Shen, & Shen, (2022); Aderinola, (2022); Singh, Thompson, Kak, Smith, & Quainoo, (2021), who indicate that adolescents who are obese, are victims of bullying and are at an increased risk for suicidal ideation, as well as suicide attempts and suicide completion. It is apparent that obese learners are overwhelmed and experience social, psychological, physical and emotional segregation and bullying which expose them to feelings of committing suicide. This may imply that they do not care about their educational outcomes as being excluded and bullied can affect the mind which cause the victim to have no reason to continue attending school.

#### **5.7.9 Obesity contributes to peer rejection and academic underperformance**

The study sought the responses of respondents on whether obesity contributes to peer rejection and academic underperformance.

The findings are shown in Table 5.23

Table 5.23 Obesity contributes to peer rejection and academic underperformance

<b>Valid</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Strongly Agree</b>	60	48
<b>Agree</b>	38	30
<b>Neutral</b>	10	8
<b>Disagree</b>	12	10
<b>Strongly Disagree</b>	5	4
<b>Total</b>	<b>125</b>	<b>100%</b>

Table 5.23 indicates that 60 (48%) respondents strongly agreed that obesity contributes to peer rejection. 38 (30%) agreed, making up 98 (78%) respondents that generally agreed that obesity contributes to peer rejection. 10 (8%) respondents remained neutral on the matter. This idea was not supported by all as 12 (10%) respondents disagreed and 5 (4%) strongly disagreed, constituting 17 (14%) respondents who disagreed with the statement. In this case, respondents basically affirmed that obesity contributes to peer rejection and academic underperformance. Qualitative data complements this finding. It emerged that obese learners are alienated, left to live alone and found to survive without friends.

One participant P4 indicated

*that obese learners "...might end up being alienated and they became lonely..." Other participants said:*

*PL2: I struggle with social interactions because no one wants to make friends with me, not to mention intimate relationships and they think I'm floppy and no one would talk to me. I have also lost my confidence. It pains me.*

*P5: The relationship is very low sometimes you find that they choose a place to be alone because they don't accept themselves and don't feel accepted by others.*

Said (2013); Juvonen, Lessard, Rastogi, Schacter and Smith, (2019) contend that obesity contributes to peer rejection and academic failure as learners' social and academic lives are entwined. This implies that the rejection of obese learners by their peers deprives them of conditions which promote progressive study, and thus leading to poor academic performance and faring far less academically. This indicates that children with the chronic peer rejection path would show the most negative academic outcomes such as dropping out of school, academic failure and grade retention. Quantitative and qualitative findings corroborate Bowker, White, & Etkin, (2021) who indicate that peer rejection is an important developmental risk factor that predicts a range of adjustment problems such as psychological maladjustment, depression, school avoidance, withdrawal, a lack of motivation, peer rejection and poor academic performance among learners.

#### **5.7.10 Obese learners have lower self-esteem and social skills**

The respondents were asked to proffer their responses regarding the existence of lower self-esteem and social skills among obese learners. Their results are displayed in Table 5.24.

**Table 5.24: Obese learners have lower self-esteem and social skills**

Valid	Frequency	Percentage
Strongly Agree	33	26
Agree	38	30
Neutral	15	12
Disagree	15	12
Strongly Disagree	24	20
Total	125	100%

Table 5.24 illustrates that 33 (26%) respondents strongly agreed that obese learners have lower self-esteem and social skills. 38 (30%) respondents agreed, making up 71 (56%) respondents that agreed with the statement. 15 (12%) respondents remained neutral on the statement. On the other hand, 15 (12%) respondents disagreed and 24 (20%) strongly disagreed, totaling 39 (32%) respondents that generally disagreed with the statement. Most respondents indicated that obese learners have lower self-esteem and social skills. Qualitative data complemented findings from quantitative analysis in viewing obese learners as individuals experiencing social, emotional and relational challenges. The self-esteem of such learners is eroded as a result of incessant mocking, bullying and name-calling from peers, which end up impacting on their confidence and self-worth. One respondent revealed that “... *students will tell you straight that you are obese, then somehow it has a negative impact in your life, you will keep blaming yourself all the time* (PL2). Two other participants said:

PL5: *They didn’t treat me fairly obviously because I was fat and they were skinny so when it was time for them to go play soccer I just had to sit down and watch them because I felt like I was not normal.*

P4: *Psycho-socially, learners who are obese, are not confident like other learners. They are mocked by their students and they are also worried they don’t do things as other kids do. They have low esteem and are withdrawn.*

The findings from the two strands of data are supported by Bacchini, Licenziati, Affuso, Garrasi, Corciulo, Driul, and Valerio, (2017); Rubina, Shoukat, Raza, Shiekh, and Rashid (2009), who point out that obese learners tend to have lower self-esteem and social skills. Obese learners are teased, derided, called by all sorts of names, stripped off their confidence and self-worth, are more likely to suffer from stigmatisation and depression which ultimately impacts their academic performance. Students who are bullied by their peers are absent from school more frequently and receive lower grades in elementary (van Lier et al., 2012) and secondary (Ladd, Ettekal, & Kochenderfer-Ladd, 2017) school. Experiences of peer victimisation predict loneliness, depression, and low self-esteem, and such anguish indicators in turn predict poorer grade point averages and test scores in elementary school (Schwartz, Gorman, Nakamoto, & Toblin, 2005) as well as amplified truancy, absences, and lower grades in school (Juvonen, Lessard, Rastogi, Schacter & Smith, 2019). Such patterns may also become cyclical, resulting in low academic achievement as the victim is always vigilant of possible humiliation and does not concentrate on school instruction which significantly impede academic performance.

**Table 5.25: Obesity has economic consequences**

<b>Valid</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Strongly Agree</b>	29	23
<b>Agree</b>	34	27
<b>Neutral</b>	20	16
<b>Disagree</b>	25	20
<b>Strongly Disagree</b>	17	14
<b>Total</b>	<b>125</b>	<b>100%</b>

Table 5.25 indicates that 29 (23%) respondents strongly agreed with the statement that obesity has economic consequences. 34 (27%) respondents agreed to the survey item. Altogether, 63 (50%) respondents generally agreed that obesity has economic consequences. 20 (16%) respondents were neutral, suggesting that they may have been unsure if obesity can cause economic consequences. 25 (20%) respondents disagreed and 17 (14%) strongly disagreed that obesity causes economic consequences. In total, 42 (34%) respondents disagreed with the

statement. Generally, the respondents indicated that obesity is a severe factor leading to negative economic consequences.

This position tallies with the findings from qualitative data which suggest that there is a symbiotic relationship between obesity and the state of the economy.

*PT5: The obesity of learners may be related to the economic status of parents who are able to employ house maids to do house chores while learners sit back and grow fats.*

One respondent said “...as their parents have employed the maidens. They do nothing when they get home they only sit and watch TV (P3). While parents may afford to provide their children with TVs, the amount and types of advertisements regarding healthy eating may not suffice to prevent obesity among learners.

Participants had this to say:

PT2 stated *The causes (of obesity) are lack of knowledge from the internet about healthy food or balanced diet...* Learners with obesity are an economic burden to the family because they regularly need to visit doctors and health care centres for treatment of some illnesses or checkups. Another respondent revealed that: “...they also become expensive because they will also be going to hospitals for medical –medical check-up. Finally, the economic status of the country as well as the quintile positions of schools influence the incidences of obesity. Schools which are not covered in the National Schools Nutrition Programme experience challenges in enforcing healthy eating among learners as they have to bring either their own food or money to buy fatty foods sold in tuck-shops and school gates.

Another respondent said:

*PT4: So here in our school learners do not get food, they don't get provision from the government, so it means that they come with their own food or own money, and go and buy outside...these fat cooks, fatty stuff.*

Erixon (2017) points out that the rise in overweight and obesity has a significant impact on healthcare costs including a loss of productivity and an increased risk of mortality and premature death. This cost can be calculated in terms of cost of illness. Latest data from World Obesity Federation (World Obesity Federation, 2015) estimates that the global medical cost to treat obesity-related diseases could reach \$1.2 trillion per year by 2025. Therefore, the existence of effort to tackle obesity is an important. Literature states that the costs of providing medical care to obese persons are about 30% more than those for individuals with normal weight (Withrow & Alter, 2011). Obesity contributes to more indirect lifetime costs for both gender types (Sonntag, Ali, & De Bock, 2014). This clearly reflects the economic effects of obesity and which play a part in the academic performance of learners as children with medical conditions are exposed to restricted emotional bonds with teachers and peers.

#### **5.7.12 Obesity is associated with poor quality of life**

This questionnaire item sought the responses regarding the existence of an association between obesity and poor quality of life. The findings are shown in Table 5.26

**Table 5.26: Obesity is associated with poor quality of life**

<b>Valid</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Strongly Agree</b>	28	22
<b>Agree</b>	40	32
<b>Neutral</b>	10	8
<b>Disagree</b>	17	14
<b>Strongly Disagree</b>	30	24
<b>Total</b>	<b>125</b>	<b>100%</b>

Table 5.26 indicates that 28 (22%) respondents strongly agreed that obesity is associated with poor quality of life. 40 (32%) agreed, making a total of 68 (54%) respondents that generally agreed that there is a relationship between obesity and poor quality life. 10 (8%) respondents were neutral. 47 (38%) respondents disagreed that obesity is associated with poor quality of life. This comprised 17 (14%) respondents that disagreed and 30 (24%) that strongly disagreed. The statistics



analysis demonstrates that most respondents agreed that obesity is associated with poor quality of life.

Qualitative data concur that poor quality of life is linked with obesity. This suggests that poor diets and unhealthy living promotes overweight bodies. There is poor nutrition intake among learners which is reflected through eating unbalanced food or food which promotes an accumulation of fats in the body.

One participant indicated: “...we go to these fast-food restaurants, buy and eat and I think that might be one of the problems that might be contributing to obesity. People should eat food that is rich, having all the components required in the body. Organic food is preferred to curb obesity although it is considered less tasty and taking a lot of time to prepare(P1). Two other participants said:

PT2: *We VhaVenda, we know that we have to eat porridge every day and mostly we like to eat porridge with meat, that is carbohydrates and protein at the same time, no nutrients at all, that is what cause obesity.*

P4: *While we were still young, we used to go and collect traditional vegetables in the field. This needs time and those ones are organic and very healthy for example black jack, full of iron and everything so our kids now don't want to eat that and more over the parents who don't know believe that eating black jack is inferior.*

Wilkins, Ghosh, Vivar, Chakraborty and Ghosh (2018) point out that obesity is also associated with poor health related quality of life. The most consumed food consists of high fat content, processed foods, more salt and sugar and high fructose corn syrup (Halpern, 2007). It is this poor quality of life, consisting of unhealthy diets, industrialisation, physical inactivity which is associated with obesity orchestrates compromised HRQL.

#### **5.7.13 Obesity results in grade retention**

The respondents were asked to indicate their responses on whether obesity results in grade retention. The findings are shown in Table 5.27.

**Table 5.27:** Obesity results in grade retention

<b>Valid</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Strongly Agree</b>	66	53
<b>Agree</b>	29	23
<b>Neutral</b>	5	4
<b>Disagree</b>	10	8
<b>Strongly Disagree</b>	15	12
<b>Total</b>	<b>125</b>	<b>100%</b>

Table 5.27 depicts that 66 (53%) respondents strongly agreed that obesity results in grade retention outcomes. 29 (23%) respondents agreed, constituting 95 (76%) that generally agreed with the statement. Only 5 (4%) respondents remained neutral. This idea was not supported by all as 10 (8%) respondents disagreed and 15 (12%) strongly disagreed. In total, 25 (20%) of the total sample disagreed with the statement. The implication from this data is that obesity has adverse academic consequences which result in grade retention. This trend also emerged from the qualitative strand which indicated that learners tend to struggle in mastering the learning contents which they are supposed to comprehend prior to proceeding to the next grade.

One responded said:

PL3: *"I struggle a lot with my schoolwork, my grades were constantly decreasing...I failed all my subjects, and my friends laugh at me..."*

The findings are in agreement with (Carey, Singh, Brown III, & Wilkinson, 2015; Halfon, Larson & Slusser, 2013; Bethell, Simpson, Stumbo, Carle, Gombojav, 2010) who observed that obese children are more likely to repeat a grade in school compared with their normal weight counterparts. Obesity and poor physical health have adverse academic consequences which result in grade retention and poor academic outcomes (Gubbels, van der Put, & Assink, 2019). The repetition of grades is indicative that obesity affects the performance of learners and that compromised motor function among obese children would lead to adolescent

obesity, physical inactivity, and low cardiorespiratory fitness, all of which are, in turn, associated with academic underachievement.

#### **5.7.14 Obese learners are absent from school more than normal weight counterparts**

This research item required respondents to indicate their views on whether obese learners are absent from school more often than normal weight counterparts. The responses are shown in Table 5.28 below.

**Table 5.28:** Obese learners are absent from school more than normal weight counterparts

<b>Valid</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Strongly Agree</b>	65	52
<b>Agree</b>	35	28
<b>Neutral</b>	10	8
<b>Disagree</b>	5	4
<b>Strongly Disagree</b>	10	8
<b>Total</b>	<b>125</b>	<b>100%</b>

Table 5.28 displays that 65 (52%) respondents strongly agreed that obese learners are absent from school more often than their normal weight counterparts. 35 (28%) respondents agreed, making a total of 100(80%) respondents that generally agreed with the statement. Only 10(8%) respondents were neutral owing, may be, to death of requisite information. In contrast, 5(4%) respondents disagreed that obese learners are absent from school more often than their normal weight counterparts. 10 (8%) respondents strongly agreed with the statement. Most respondents indicated that obese learners are absent from school more than their normal weight counterparts. School attendance is believed to contribute to success and good performance at school. However, this is not always the case among obese learners due to health issues related to their weight.

Qualitative findings supported the quantitative analysis in highlighting that learners with obesity are frequently absent from school as a result of various health problem.

Such learners become expensive to bring up because they should visit hospitals and consult medical practitioners for treatment. This causes them to be absent from school and to miss out on school activities fueling academic underperformance. Two participants said:

*PT3: They also become expensive because they will also be going to hospitals and when they go there their education is affected because they will not be coming to school (absent).*

*PT5: ...it brings diseases to learners in such a way that they frequently ask for permission to go to the clinics and hospitals for certain types of illnesses and so on.*

A considerable amount of literature by Liao, Chang, Wang and Wu (2013); An, Yan, Shi, and Yang, (2017) support this outcome by revealing that obese learners are absent from school more often than their normal weight counterparts on reasons of medical reviews or ill health. Obesity as a serious health nutritional disease among children can affect children's learning achievement and school attendance. Studies have similarly suggested that obesity in childhood has become a serious health epidemic that impact on learner academic performance due to absenteeism resulting from indirect obesity related mechanisms leading to increased school absenteeism. Obesity-related psychosocial distress such as bullying, stigmatisation by peers and teacher's isolation, poor sleep due to obesity-related disordered breathing, poor nutrition intake and physical inactivity and sedentary lifestyle alters school attendance which lead to poor academic performance. This confirms that obese learners experience the challenge of having to miss school activities while seeking medical care, which consequently retards their academic performance. As obesity is more likely to affect children's school attendance and academic performance through its detrimental impact on their physical and mental health, which effect in them suffering from illnesses that result in excessive absenteeism. Such chronic absenteeism substantially wanes their motivation for school attendance which negatively impacts on their academic accomplishments.

## 5.8 Perceptions of learners on obesity

This section presents the perceptions of learners on obesity regarding their academic performance. The issues of focus included the belief that obese learners are perceived as untidy and less able, obesity associated with less friends and being stupid as well as the level of literacy of parents.

### 5.8.1 Obese learners are perceived as untidy and less able

The respondents were asked to indicate their views on the statement that obese learners are untidy and less able. The findings are given in Table 5.29

**Table 5.29** Obese learners are untidy and less able

Valid	Frequency	Percentage
<b>Strongly Agree</b>	55	44
<b>Agree</b>	36	29
<b>Neutral</b>	12	10
<b>Disagree</b>	15	12
<b>Strongly Disagree</b>	7	5
Total	<b>125</b>	<b>100%</b>

Table 5.29 indicates that 55 (44%) respondents strongly agreed with the statement that obese learners are perceived as untidy, and less likely to succeed at school. 36 (29%) respondents agreed with the questionnaire item. In total, 92 (73%) respondents generally agreed that obese learners are considered untidy and less able to perform at school. Only 12 (10%) respondents were neutral on the issue. Furthermore, 15 (12%) respondents disagreed and 7 (5%) strongly disagreed that obese learners are less tidy and least able to succeed in their school tasks. Most respondents (73%) acceded to the view that obese learners are less tidy and slow to school performance. Qualitative data confirmed the findings that obese learners are poor achievers at school but their untidiness was not elaborate. It was indicated that they quickly outgrow their uniforms, which may be construed for being untidy when the put-on clothes that are smaller than their body sizes. One participant said:

PL1: *The result number one, is that most of my trousers were so smaller within a period of 4 weeks...I cannot perform well during LO in PE activities, I feel bad about it as my classmates laugh at me... (the learner was showing remorse and rail in pain) ...*

This finding regarding the perception of learners as untidy and less able to perform at school is supported by literature, which states that obese young people rate their academic performance lower than their non-obese peers as they are untidy and less able (Puhl, Luedicke, & Grilo, 2014). The attributes of teachers may also play a role in the poor academic achievement of obese girls throughout schooling from prekindergarten through postsecondary school, obese children are frequently assumed to be sluggish, less productive, less intelligent, and less socially desirable (Puhl, Heuer, & Brownell, 2010). In this study, the two strands of data concur that obese learners do not perform well at school. Their untidiness is not clearly apparent but inferred from the available data. Children with obesity are perceived by their peers as being less athletic, unattractive, lazy, mean, dishonest, and stupid, and are less likely to be chosen as a friend (Daffin, & Lane, 2021).

### 5.8.2 Obesity is associated with few friends and being stupid

Respondents were requested to reflect their views on whether obesity is associated with few friends and being stupid. The responses are presented in Table 5.30

**Table 5.30: Obesity is associated with few friends and being stupid**

Valid	Frequency	Percentage
<b>Strongly Agree</b>	57	46
<b>Agree</b>	36	29
<b>Neutral</b>	8	6
<b>Disagree</b>	20	16
<b>Strongly Disagree</b>	4	3
<b>Total</b>	<b>125</b>	<b>100%</b>

Table 5.30 shows that most the respondents at 93 (75%) agreed with the statement that obesity is associated with being stupid and having few friends. This idea was

not supported by all respondents as 8 (6% of them remained neutral. 20 (16%) respondents disagreed and 4 (3%) strongly disagreed. In total, 24 (19%) respondents disagreed with the survey item. Therefore, most respondents agreed that obese learners are associated with being stupid and having few friends.

Qualitative data confirmed the findings of quantitative analysis, which basically viewed learners with obesity as stupid (unwise or senseless) and with few friends.

One respondent indicated that obese learners “... *are also worried as they don’t do things as other kids do*” (P2). Another respondent added that “... *they cannot respond well to what we are doing at the soccer field because of overweight* (P3). This reflects that obese learners lack the capacity to think and act at the level of their peers. As a result, they are shunned by colleagues because they cannot freely interact with them on the basis of common skills, characteristics and abilities. They are laughed at and teased in ways that hinder the formation of friendships. Participant said:

*P1: Most of the time they are teased and you find that some of the colleagues will laugh at them. When it comes to relationships, it’s hard to find them having a relationship because of their “big” bodies.*

This finding is supported by a considerable amount of literature, which confirms that children with obesity often experience high levels of social exclusion, and attribute their weight as the reason for this exclusion and for having few friends, being ugly, stupid and mean (Thedinga, Zehl, & Thiel, 2021).

## **5.9 Conclusion**

This chapter presented the analysis and interpretation of data regarding the impact of obesity on learner academic performance in rural secondary schools. This section confirmed that obesity is prevalent among learners in schools, obesity is higher in females than males and that there is an increase in obesity among learners. The study showed that the prevalence of obesity is evidenced through the incidence of hypertension and other non-communicable diseases of the 21<sup>st</sup> century.

It was also established that learners in South Africa are at risk of obesity, that obesity increased between 2010 and 2017 and that technology limits the participation of learners in sports leading to sedentary lifestyle. Most learners were found not to meet the required levels of physical activity as an indication of existence of obesity. On the causes of obesity, the study highlighted the increased weights of learners as contributing to the development of obesity. The lesser the number of times that learners spend on physical activities, the higher the likelihood of the incidence of obesity. Most learners spend their leisure time on sedentary life, characterised by inactivity while watching television and playing electronic games.

On the impact of obesity on learner academic performance, the study verified that learners can suffer from a range of illnesses such as hypertension, cardio vascular diseases (CVD), cancer, impaired insulin sensitivity, diabetes, asthma, menstrual abnormalities and orthopaedic problems. Obesity may increase the risk of premature death caused by poor quality of life, stigmatisation, depression and anxiety. Learners with obesity were shown to perform poorly compared to normal weight children, to experience teasing from peers' and teachers with high affinity to commit suicide. Obesity causes economic consequences, low self-esteem, suffer peer rejection, poor quality of life and grade retention. Obese learners miss school more than other normal weight peers. Such learners are perceived as untidy and less able, associated with less friends as well as parents with low levels of literacy regarding healthy life style. The next chapter proffers conclusions and recommendations derived from the data analysed in Chapter 5, contributing also to the discourse on obesity through a model to mitigate the prevalence of this stigmatizing condition.



## **CHAPTER 6**

### **SUMMARY, CONCLUSION, AND RECOMMENDATION**

#### **6.1 INTRODUCTION**

This chapter concludes the research. The general aim of this thesis was to assess the impact of obesity on learner academic performance in rural secondary schools in Mvudi circuit of Vhembe District. The research questions focused on the prevalence, causes and the impact of obesity on learner academic performance in rural secondary schools. This concluding chapter presents the strengths and limitations of this research and suggests directions for future research. Finally, reference to the literature reviewed in the contextualisation of this study, recommendations and conclusions are proffered. The research objectives of the study were achieved through a focused literature review that exhibits both recent understandings of the conundrum as well as its relevance to the research questions. This was in tandem with data gathered from participants through self-administered close-ended questionnaires and focus group interviews and discussions from rural secondary school learners in Vhembe District.

To assess the impact of obesity on learner academic performance, both quantitative and qualitative methods of data collection were used to accomplish the objectives. Self-designed close-ended questionnaires were used to collect data from ( $n=125$ ) grade ten or eleven learners sampled for this study. For the qualitative method ( $n=10$ ) sample was interviewed on the prevalence, causes and impact of obesity on learner academic performance in rural secondary schools in Mvudi Circuit of Vhembe District.

#### **6.2 SUMMARY OF THE RESEARCH PROCESS**

The research was a mixed method study with a convergent parallel design. The pragmatic paradigm underpinned the research procedure. The study was grounded on the Social Ecological Systems conceptual framework.

Two methods of data collection were used to answer the research questions which were the quantitative and qualitative strands. For the quantitative strand, simple random sampling technique was used to select a total of one hundred and twenty-five learners from the five secondary schools sampled in Mvudi circuit.

Purposive sampling yielded ten informants (learners and teachers) who were initially in the quantitative sample because of the role they played either as victims or perpetrators of negative perceptions on obese learners. Self-designed close-ended questionnaires were used to collect quantitative data. Five rural secondary schools in Mvudi circuit and focus group interviews and discussions were used to collect qualitative data. Quantitative data were analysed using SPSS version 25 while the qualitative data in the form of verbatim vignettes, coding and theme development were used to analyse qualitative data. Quantitative and qualitative data were analysed separately before merging and integrating them into the existing literature in order to derive the patterns and significant meanings on the impact of obesity on learner academic performance.

### **6.3 HOW THE STUDY ADDRESSED THE RESEARCH OBJECTIVES**

The aim of the study was to assess the impact of obesity on learner academic performance in rural secondary schools in Mvudi circuit of Vhembe district. This aim was achieved through the following four objectives:

#### **6.3.1 Objective 1: Prevalence of obesity in rural secondary schools in Mvudi Circuit of Vhembe District.**

Through this objective, the study assessed the prevalence of obesity among rural secondary school learners from different family backgrounds. Learners responded to the questionnaire and noted that obesity is prevalent among school learners across gender and age group. Evidence to support this assertion is in Table: 5.5. Quantitative and qualitative results show that obesity prevalence is high in South African school children, including those in kindergarten. This was affirmed by 88% of respondents who highlighted that obesity is high among school learners across different ages and gender which was corroborated by participant who said that

*“obesity is a disease and an abnormal increase in weight among school learners. Each year the number of obese learners we admit is always increasing.”*

It can be noted from above that the notable obesity prevalence knows no boundary in terms of age, developmental stage, race, developmental level of the country, rural or urban school setting and socio-economic status of the family and gender.

The findings of the study show that obesity and overweight are prevalent traits in the rural schools of Vhembe District particularly among girls since generally they aspire to possess the “culturally ideal body image.” School girls are more prone to obesity and overweight compared to boys. This might be a consequence of increased periods of pursuing a sedentary life and less participation in physical activities. Educators and parents are viewed as the agents to best facilitate institutionalized fitness and nutrition programmes in schools (CDC, 2019; Mission Readiness, 2018). This further augments the body of evidence showing that obesity does not start upon entering adolescence, teenager or young adult age, but rather that it starts at the early infant and preadolescent stage.

#### **6.3.2 Objective: 2 Identify the causes of obesity on learners’ academic performance in rural secondary schools in Mvudi Circuit of Vhembe District.**

This objective was achieved through identifying the causes of obesity and overweight. It was found that behavioural factors, COVID 19 related mitigation strategies, industrialisation, physical inactivity causing sedentary life style as influenced by media advertisements, technological devices like TV and computer games all contribute to obesity. The child’s family income also influences parents to organise school transport as they can afford to make such provisions and in the process demonstrate some relative degree of affluence. Learners do not cycle or walk to school but use motorized transport. Unhealthy nutrition coupled with food portion size and consumption of sweetened sugary beverages, fatty foods and fries such as fast-food consumption influenced by the availability of convenience stores, malls with fast food outlets and environmental factors such as adoption of western type of life style contribute to obesity and massively alter the cognitive functioning

amongst learners, thereby exposing these participants to the threat of poor academic performance.

COVID19 has triggered anxiety, pain and depression in people of all ages around the world. Mitigation strategies such as social isolation and quarantine cause death particularly to people at risk such as obese learners due to the co-morbidity condition. As they self-isolate they ultimately miss school, cannot have face-to-face contact with their teachers and this exerts an adverse impact on their academics. Learners indulge in emotional eating which exacerbates obesity while trying to reduce the frustrations caused by COVID19. It emerged that learning facilitation through multimodal means such as ZOOM, TEAMS or MOODLE is not possible due to the socio-economic status of the family and schools that do not have technological infrastructure that can cater for remote learning. Many of the comorbidities associated with obesity are facilitated by or contribute to an extremely high prevalence of physiological and psychosocial complications among obese population as shown in Table 5.13 where (83%) agreed that obesity causes health problems and underperformance that negatively impact on learning leading to poor academic performance among school children.

The number of times the learners attended physical activity lessons is generally low, although varied. The reasons given for this trend were that teachers had a lot to cover from the school syllabus while others hired playgrounds thus limiting the number of times learners attended physical activity lessons. PE is offered after school where learners claim to be tired and feel demotivated to participate as LO is a compulsory subject in school even though it contributes no points for entrance into tertiary education.

The respondents spent their leisure time indulging in sedentary lifestyle. Learners from affluent families in most cases are enclosed in their homes and are not allowed to mingle with the rest and play while it is the reverse for the learners attending public schools. Poor nutrition intake among respondents is a major concern due to lack of knowledge about the effects of obesity on the psycho-social, physiological and mental dimensions of learners that impact academics.

Poor family background compels learners to feed from what is on the table just to fill their stomach and not considering the nutritional value of such food. Family background and schools were found to influence food choice and preferences. Food palatability is found to be associated with being sweet, fatty and cheap.

### **6.3.3 Objective 3: Effects of obesity on learner academic performance in rural secondary schools in Mvudi Circuit of Vhembe District.**

A critical consequence of the increasing prevalence of obesity is the burden of illness associated with excess body weight as stressed by (Sung, Siegel, Torre, Pearson-Stuttard, Islami, Fedewa, & Jemal, 2019). It has been repeatedly reported that childhood obesity is associated with health risk factors and multiple diseases. The immediate health risks, such as orthopaedic, neurological, pulmonary, gastroenterological, and endocrine conditions, are becoming more common among severely overweight children as this population of children is at a high risk. Childhood obesity can adversely affect nearly every organ system and often has serious consequences, including hypertension, dyslipidaemia, insulin resistance, prediabetes, type 2 diabetes mellitus (T2DM), fatty liver disease and psychosocial complications that hinder positive educational outcomes (Kumar, & Kelly, 2017).

Research has established that obese students achieve poor academic results due to compromised health. Some studies have demonstrated that cognitive ability is influenced by obesity and the likelihood of being obese is influenced by the quality of nutrition intake. In short, as the quality of nutrition decreases, the chance of obesity increases, so poor nutrition is associated with poor academic performance (Faught, Williams, Willows, Asbridge, & Veugelers, 2017). Balanced nutrition is central for endurance, physical growth, intellectual development and output. Table 5.5.4 confirms that 115(92%) of the respondents in this study agreed that there is a strong relationship between obesity, diet and academic performance.

When obesity has an impact on children's physical and psychological health, its association with children's academic achievement becomes a concern for parents and educators. However, as the effort to identify reasons for childhood obesity has generated a lot of intense research, showing how nutrition patterns at school or at

home and sedentary lifestyle can impact academic performance. As established in this study, obesity in childhood and adolescence is related to academic achievement and this calls for increased support for interventions aimed at preventing and treating obesity and its impact among young people.

Obesity adversely impacts the physical, social and mental health of an individual, leading to increased school absenteeism. Obesity-related psychosocial distress such as isolation, bullying, stigmatisation by peers and teachers, poor sleep due to obesity-related disordered breathing, cardio-metabolic co-morbidities, poor nutritional intake, dissatisfaction with one's body, depression, stereotype threat, type 2 diabetes, teasing and low levels of physical activity or fitness are all consequence that exert a negative impact on learning. Obese children are often victims of exclusion by peers. Furthermore, adults shun them, because of their hefty and poor body image. Thus, obese children experience low self-esteem which stimulates psychological stress, poor intake habits and dissatisfaction with one's body and suicidal thoughts. Obese children can even gain more weight which could lead to diabetes (Zhu, Zhang, Li, Xie, & Yang, 2013) and experience poor educational outcomes.

Obese children are likely to experience diminished self-esteem, weight-based teasing, (MacPherson, 2018; Libbey, Story, Neumark-Sztainer, Boutelle, 2008); disorders in eating behaviours, bullying and teasing that culminate in the bullied bullying others, name-calling, physical bullying and segregation (Puhl, Peterson & Luedicke, 2013); verbal, physical and relational peer victimization (Puhl & Latner, 2007); binge-eating and fasting, avoidance of physical activity (Puhl & Suh, 2015); and retarded school performance.

#### **6.3.4 Explore the perceptions of learners on obesity in rural secondary schools in Mvudi Circuit of Vhembe District**

Participants in the focus group interviews perceived obesity as emanating from the consumption of unhealthy diets, food portion size and consumption of sugary beverages. The most prominent contribution lies in the frequent uptake of fast food, technology use such as remote devices, computers, video games, and television.

Lack of outdoor activities was added to the factors supporting the development of obesity. Obesity also attracts mockery from counterparts because it inhibits participation in play and accelerates the development of fluffy body shape.

Given that the school environment is a frequent setting of weight-based victimization and discrimination, it is not surprising that these learners are more likely to avoid school, or have erratic attendance, which impacts academic success. Teachers in public schools appreciated the importance of PE lessons for their learners, since they were still young and growing thus, they required enough time to relax and play. It was observed that in public schools they had large fields where learners could play. However, they had scant sporting equipment and sports facilities.

### **6.3.5 How the findings relate to the theoretical framework used in the study.**

The Socio-Ecological model (SEM) provided a guiding framework to analyze and understand the various factors that influenced students' food choices in a school setting and ultimately health outcomes such as overweight and obesity that cripple the learner's academic performance.

Schools have been deemed an ideal environment for childhood obesity prevention efforts because of their important role in providing nutrition (Welker, Lott & Story, 2016). Further, studies have shown that the school food environment influences what and how much children would eat, as well as their weight and BMI outcomes. The use of the Social Ecological Systems theory as scheme for studying the relationship between teachers and child development is important in strengthening the relationship in the Microsystem, Mesosystem and Exosystem (Benjamin, 2015). Connections between teachers and learners can be affected by the teacher's / student relationships, characteristics of children's body structure as obesity, health risks associated with obesity, socioeconomic status, eating behaviour, sedentary lifestyle, eating styles and culture.

Ecological models are relevant when addressing health behaviours such as overweight and obesity (Froehlich Chow & Humbert, 2014; Määttä, Ray, Roos, & Roos, 2015).

The three environments comprised of different settings are responsible for the transmission of skills, knowledge and attitudes necessary regarding food quantities, food portion, the etiquette of eating and choice. The Microsystem (school, home) are responsible environments for purchasing, providing suitable and balanced meal to children. An active lifestyle reduces the risks of overweight and obesity as well as chronic diseases (Park, Falconer, Viner, & Kinra, 2012). Given the current decline of fitness among children and the rise in obesity, schools and childcare centres are promising avenues to reverse this trend as it compromises education accomplishments.

Mesosystem (family members, teachers, peers) are responsible as role models for sound behaviour. Children experience two sets of adults comprised of healthy ecology such as supportive teachers interested in addressing obesity challenges and improving academic success. Proper support systems can be offered by teachers, peers and family members to deal with psycho-social consequences of childhood obesity. Teachers are key players in children's proximal environment and can play a role in children's PA levels. In this respect, best-practice guidelines recommend that they encourage and join children in active play in the capacity of role models and coaches.

Exosystem (SNP, SES, media) low- income status is associated with increased risk for obesity. Media advertisements influence food choice for obese children who are always glued to TV. Media have played a particularly prominent role in social and nutritional change toward a western diet high in fat, sugar, and salt (Popkin, Adair, & Ng, 2012). Qualitative findings verify that adolescents frequently consume sweet beverages and very few take vegetables. More than 80% of the advertisements are for unhealthy products such as fast food, candy, and soft drinks (Powell, Schermbeck & Chaloupka, 2013), and nutrient-poor foods are advertised at a higher frequency during children's peak viewing times (Galbraith-Emami, & Lobstein, 2013), contributing to the burgeoning scourge of obesity. Government is keen to assist in mitigating obesity through the provision of NSNP, child support grant, COVID19 relief grant and the provision of food parcels.



## 6.4 SUMMARY OF THE STUDY

Regardless of the abundant scientific literature pointing to the benefits of physical activity on health, a lot of young people still adopt a sedentary lifestyle which is characterised by an increased time of viewing TV, playing video games on computers and participating in social media platforms. This sedentary life promotes physical inactivity, and combining this with faulty nutritional habits, results in the development of chronic diseases of lifestyle (CDL) such as obesity and overweight, drug abuse, high blood pressure and diabetes (National Centre for Disease Control, Prevention, and Health Promotion, 2010). Obesity and overweight are broadly accepted as strong predictors of CDLs and are antecedents of metabolic syndromes and cardiovascular disorders later in life (Ruiz *et al.*, 2007:61).

The World Health Organisation (WHO) (2010) argues that obesity and overweight among adolescents and learners have attained epidemic proportions in a number of developing and developed countries. Studies show that obesity and overweight are a result of a plethora of factors. In the same breath, a consensus exists among scholars that an active physical lifestyle, coupled with modifications in dietary behaviours, is an effective treatment for CDL (Ortega *et al.*, 2007:15). Obesity is not just an obstacle in developing nations, but a fast-increasing health challenge in nations experiencing epidemiological transition and industrialisation. Therefore, the inter-relationships among unhealthy lifestyle, disease-risk factors and the outcome of obesity justify identifying and regularly monitoring these factors, particularly among learners and adolescents in South Africa, to enable requisite interventions to be implemented to curtail the trend.

According to WHO (2010), the PA has been recognised as an integral part of a healthy lifestyle owing to it being a crucial component in health behaviour associated with reduced mortality and morbidity, as well as CDL among youth and learners. It is therefore submitted that involvement in PA in early childhood has the propensity to lower health risks linked to inactivity at adolescence and adulthood. While participation in PA which is moderate to vigorous diminishes the risk of body weight disorders and obesity among children (Van Deventer, 2008), physical inactivity is linked to a rise in body fat.

Draper et al. (2014) contends that South Africa is going through epidemiological and nutritional transition where western diets are commonplace. This phase is characterised by combined states of obesity and under nutrition, factors related to poverty and the SES of the family, physical inactivity and infectious diseases such as COVID 19. Alberts et al. (2005) state that cardiovascular and metabolic risk factors are rising rapidly in the country as a result of an increase in industrialisation, urbanisation, and the adoption of Western lifestyles. These affect the lives of people negatively and are most likely to amplify the socioeconomic and public health burden within the immediate future.

International surveys, inclusive of those conducted by Hardman and Marshall (2001) and Subramanian and Silverman (2007), report that PA as described in the physical education and organised sports contexts of schools, has persistently dropped in many nations. Schools provide a logical platform for daily PA promotion and enjoy a strategic position to promote healthy lifestyles among learners. Post-independence in 1994, PE got replaced by Life Orientation in curriculum provision and this resulted in substantive reduction in the official time allocated for instructional delivery in the subject, poor resources and reduced prioritisation of the involvement of learners in practical activities. This perceived marginalisation of PE in the curriculum has created unsupportive conditions in which many schools are built without playgrounds, teachers not well trained and provided with less resources to teach PE, and not accorded conducive opportunity to participate in active PA lessons (Toriola et al., 2010).

Despite the positive relationship that has been established between PA and physical fitness (ACSM, 2009), limited research has explored the level of association among these parameters of fitness and the risk of diseases in South African learners. The variations in the rate of growth and fat patterning among learners makes it difficult to explore the relationships between physical activities and obesity across populations. However, the definitions of such interactions in affecting phenotypes associated with cardiovascular morbidity are crucial to identify at-risk learners, early emergence of complications and those individuals likely to be resistant to planned interventions for the optimisation of health outcomes. A good measure of abdominal visceral adipose tissue appears to be associated with the sum of two skinfolds.

In spite of the usefulness of these measures to locate risk cause of CDL in learners, a variety of cut off points occur in literature and there has been a suggestion to develop norms that are population specific (Goon et al., 2009). Considering the adverse consequences of body weight disorders on the social, economic and health life of learners in South Africa, it is pivotal to evaluate the existing trends with regard to the anthropometric indices relating to the composition of the body, PA, and the status of physical fitness related to health. It is also critical to evaluate sex and age specific measures to assess risk factors among learners in an effort to decide on the relationship among these variables.

## **6.5 LIMITATIONS OF THE STUDY**

The findings of this study should be interpreted considering the following limitations: whilst an attempt was made to randomly select the schools and learners in the Mvudi circuit of Vhembe District in Limpopo Province to participate in the study, this was not feasible as the research was carried out only in rural secondary schools confined to Mvudi circuit of Vhembe District. Therefore, the data collected and the findings cannot be the representative of all secondary schools in Vhembe District in the Limpopo Province. The other limitation was that the sample size was quite small ( $n=5$ ) sampled rural secondary schools in Mvudi Circuit, qualitative sample ( $n=10$ ) rural secondary school teachers and learners. The above limitations prohibit the generalisation of the findings to other sites in Limpopo or other educational demarcations in South Africa.

The prevalence of obesity in the rural secondary schools of Vhembe District has been previously reported by some researchers. However, a comparison of this study with preceding research done in the rural secondary schools in Vhembe District shows that the rate of obesity and overweight among adolescents and learners is high and worsening without any signs of improvement (Zaghloul et al., 2013; Al-Haifi et al., 2013). For instance, in 2010, the prevalence of obese and overweight learners was 16% and 20%, respectively (Al-Isa, Campbell & Desapriya, 2010). A recent study conducted by Al-Haifi et al. (2013) with adolescents demonstrates that 46% of girls and 50% of boys that participated in the study were obese or overweight.

Similarly, the findings of this study show that a quarter of the surveyed participants (25%) or N=125, are overweight and more than one third of the participants, that is 36%, are obese. As a further explanation of age as a factor in the risk of obesity and overweight in Vhembe District, the level of obesity and overweight of learners is judged to increase with the rise in the age of adults or their parents. Findings of this study and previous studies clearly confirm that the population of Vhembe lives in an unhealthy environment which has resulted in a rise in the prevalence of obesity and overweight. Such a condition contributes to obesogenic state in the context of this study. Therefore, an increase in the age of people results in a corresponding increase in the weight of learners because of the unhealthy conditions in which they live.

The findings of this study verified that lengthy periods of TV watching and sedentary behaviour are related to obesity, loneliness, body image dissatisfaction and body image disorder. This study confirmed that a sedentary lifestyle, which entails playing video games, watching TV and sitting on the computer, has significantly contributed to the development of obesity, more so for females than male learners. However, contrasting findings from a cross-sectional study of adolescents in Saudi Arabia suggest that there is a positive relationship with regard to the weight of female and male adolescents and a sedentary lifestyle (Al-Nuaim et al., 2012). In the same breath, a review of literature on sedentary lifestyle offers evidence that a rise in any sedentary behaviour attribute is linked to decreasing physical activity and appreciating BMI of adolescents and learners in the age range of 13 to 17 years.

In support of this evidence, research indicates that the period spent in sedentary behaviours is associated with obesity and overweight learners (Falbe et al., 2013) resulting in the learners' poor academic performance. This implies that the time spent by learners on physical and sedentary activities must be considered in the various strategies with the aim of combating the challenge of obesity and overweight. Social isolation and distancing exacerbate obesity and overweight among learners. Learners feel lonely and overwhelmed by boredom that drives them to resort to emotional eating and snacking while engaged in prolonged screen viewing.

The participants in interview and focus group discussion showed that schools may have a significant influence on the health of learners, especially in their mandate to provide health education and creating awareness with regard to health matters, availing healthy food to students, offering PE lessons to support body exercise. This study highlighted that schools might play a prominent function in preventing learners from developing obesity as a result of the extended time that they spend within the school precinct. The study emphasises the point that the environment is an important actor which could play a pivotal purpose in shaping the behaviour of individuals.

There is also extant research which indicates that schools possess a huge influence on the dietary habits and physical activities of learners (Clarke, Fletcher, Lancashire, Pallan & Adab, 2013). It is of interest in this present study that schools are incorrectly blamed for playing a part in contributing to the unhealthy lifestyles of learners. This relates to unhealthy food served in school canteens and for failing to encourage learners to be physically active. The entire participants in the present research expressed that there is a dearth in specific policy on nutrition provided in school canteens and they opined that the school canteens serve food which is unhealthy owing to the high sugar and fat content.

Participants indicated that teachers have a major function to play in preventing learners from becoming obese because they serve as advisors on health habits, monitor the eating habits of learners as role models and educate them regarding the consequences of obesity and overweight. It is understood that all teachers, including specialist teachers such as language and music teachers, have an impact on the health behaviours of learners. Similar findings were reported by Prelip et al. (2006), who assessed the perceptions and roles of 78 schoolteachers with regard to the provision of school nutrition to learners. Their findings confirmed that teachers are aware of their roles in educating learners on nutrition in their capacity as teachers, role models, advocates and motivators. Research studies done in similar school settings show that teachers perceive themselves as playing an important role in the prevention of learner obesity (Stanfill, 2014).

Teachers are the first port of call with regard to interacting with learners at school, and a majority of learners recognise the influence of teachers in shaping their own behaviour. The health initiatives of schools are often delivered by teachers to learners at schools (Cunha, de Souza, Pereira, & Sichieri, 2013). Teachers play a crucial function in influencing the BMI of learners, encouraging physical activity and self-efficacy in the intake of fruits and vegetables, discouraging the consumption of drinks that are sugar-sweetened, chips, and seriously advise against sedentary lifestyles.

Participants in the focus groups rejected the existence of food nutritional programmes at school. To promote healthy food and exercise in such schools, teachers in some of the sites that participated in this study stated that they perform individual efforts through placing posters in their classrooms. Teachers also hold brief sessions with learners to discuss the promotion of food habits which are healthy and engage their students in health problems linked to obesity and its impact on learning. This stance was executed by individual teachers. However, teachers noted time, poor curriculum and lack of parental support were barriers in their efforts to decrease instances of obesity. Government is more interested in getting sound academic results which are altered by the impact of obesity. In this respect, very little of value is done to address obesity among learners.

It is interesting to realise that in this current study, four teachers agreed that learners are attracted to unhealthy foods and that teachers have a habit to use junk food as rewards to better performance. Similarly, Kubik, Lytle and Story (2005) established that the use of food as an incentive for increased performance was most prevalent in schools. Clarke, Fletcher, Lancashire, Pallan and Adab (2013) argue that the use of unhealthy food as a reward for good behaviour is an impediment to effective promotion of healthy habits of eating at school.

## **6.6 RECOMMENDATIONS FROM THE STUDY**

This section provides recommendations based on the findings of the study as follows:

### **6.6.1 To identify the causes of obesity in rural secondary schools in Vhembe District**

- In view of the learners' low physical activity (PA) status, it is essential for school authorities to offer enough opportunities for learners to participate in PA and sporting activities at school. It is pertinent that school authorities, teachers, the community, parents and other stakeholders get involved in the quest to create proper social and emotional conditions that motivate learners to actively participate in physical activities.
- Parents should be conscientised on the need for their children to experience outdoor play and to mingle with their peers in ways that encourage more physical activity.

### **6.6.2 To assess the prevalence of obesity in rural secondary schools in Vhembe District**

- Nutrition education should be provided to both parents and learners, that is, wise choices when selecting meals and snacks.
- The Department of Education should provide education programmes that seek to appraise both parents and learners on the ways in which technology could be used to promote healthy living and wellness.

### **6.6.3 To determine the effect of obesity on learner academic performance in rural secondary schools**

- Schools should encourage healthy eating through training in practical food skills, adapting healthy nutrition standards for school meals and varieties of food sold in their canteens.

- It is necessary that studies be carried out on the composition of the human body, physical activities related to health, to avert disease risk factors among learners across provinces in South Africa. There is need to implement regular monitoring programmes of the dependent variables to determine the trends in the emergence of body weight disorders and related metabolic disease and cardiovascular challenges. The ability to identify learners at-risk would help to reverse undesirable trends and maximise the outcomes of health.
- Social distancing and stay at home orders used as strategies to mitigate the spread of COVID19 should be applied with care especially on school children as they are overwhelmed by feelings of loneliness and boredom which trigger emotional eating to cope better. Parents and teachers should serve as support systems for this vulnerable group at risk.

#### **6.6.4 To explore the perceptions of learners on obesity in rural secondary schools in Vhembe District**

- Schools should promote physical activity by incorporating a variety of recreational activities and more time for engagement in such activities during Life Orientation period.
- Physical Education (PE) avails an ideal chance for learners to participate in PA, making it reasonable to advocate for the teaching of PE as a separate curriculum component. It is ideal that PE be detached from Life Orientation and presented as a stand-alone subject that is included on the calendar of schools. This would require the provision of resources for the teaching of PE inclusive of the preparation of requisite teachers.
- School vendors are obliged to sell healthy foods and avoid selling unhealthy sub-standard fries and sugary junk beverages.



## 6.7 Thenga's Proposed Model on Child Obesity and Academic Performance

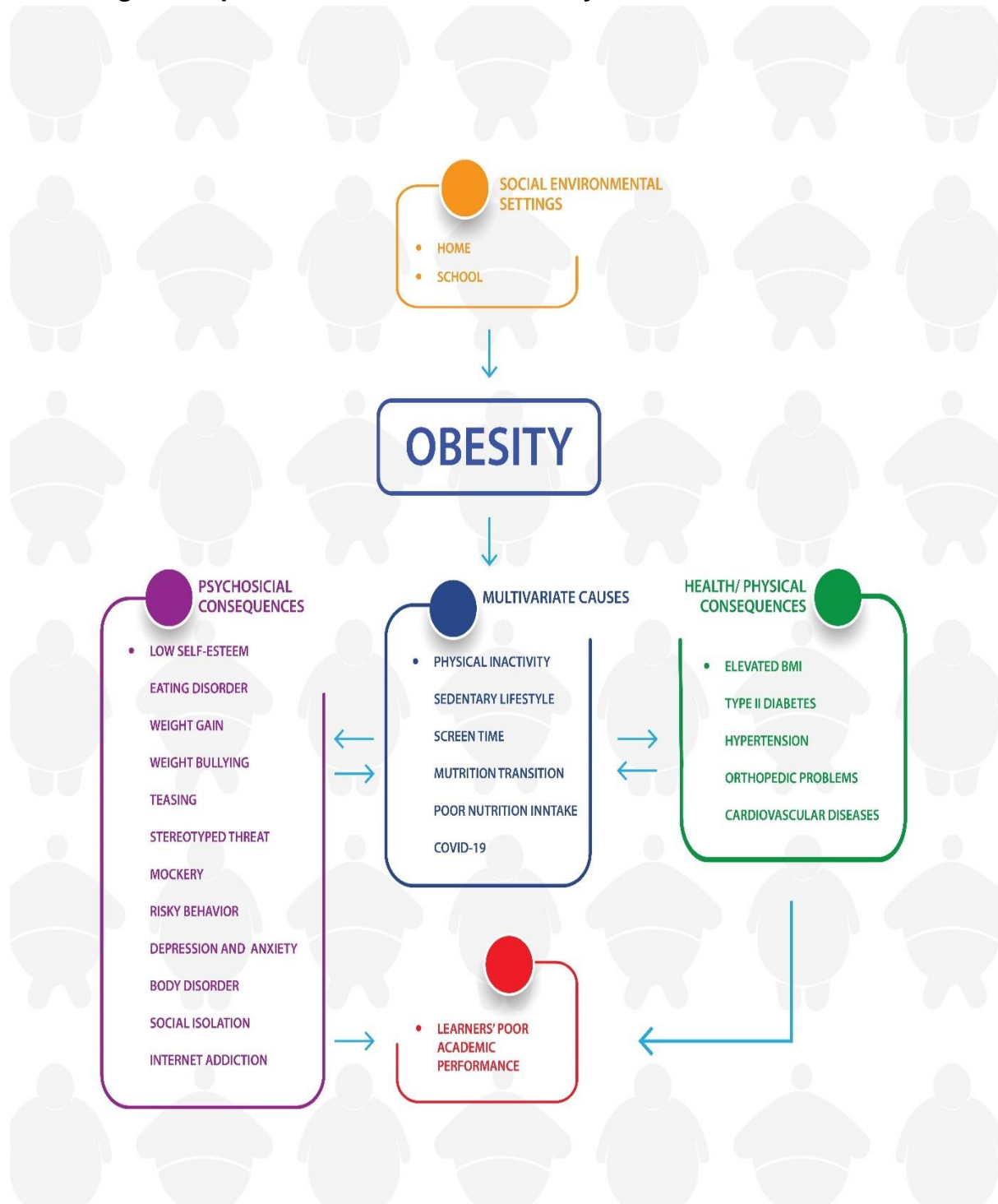


Figure 6.7 clarifies the key variables and the nature of their interactions in the ecological process regarding the causes and effects of obesity on learners' academics. There is mutual engagement between: teachers, learners, peers, parents and family members.

### **6.7.1 The Social Environmental Settings**

The model is situated within the two inseparable environmental settings: the home and the school. No individual lives in isolation. Environmental factors can influence each other and learners can be influenced by friends, parents, teachers, media and family. This shows that obesity can emanate from those two settings caused by the family's eating patterns and the type of food purchased. The Social Ecological Systems Theory clarifies forces which influence the health comportment of school learners. Children can experience obesity from home or from schools. The environment constitutes the physical, cultural and psychosocial spaces within which children grow and develop. These exert a major influence in shaping the nature, characteristics, relationships and dispositions of learners to education.

The social and physical factors usher the child's development in the context of the body weight. The social setting (Microsystem, Mesosystem and Exosystem) consisting of the school, teachers, home, family members, peers, community and socio-economic status of the family tend to influence the types of food intakes as NSNP which contribute energy imbalances in the learner. In addition, the physical environment helps to shape the body structure of learners, which subsequently impacts on body fat.

### **6.7.2 Obesity**

Child obesity is mainly perceived as the outcome of factors of the environment, consisting of the school and home. This pertains to the consumption of fatty and sugary unhealthy foods, and indulging in behaviours that lead into sedentary lifestyle and western diets, food choice and eating patterns. These are comprised of the secondary factors such as the social, physical, dietary regimes. However, the tertiary level factors inclusive of genetics and hormonal considerations exert an impact on excessive dietary intake. Obesity or overweight is a source of a host of problems which may be physical, cognitive, emotional, psychological, and health related such as hyperactivity disorders and depression. It is therefore imperative that both home and school be used as spaces and contexts where obesity and its challenges are mitigated to ensure the academic performance of learners is improved.

### **6.7.3 Psychosocial Consequences**

The psychosocial factors affecting the individual have a primary influence in the academic development of learners. The consumption of food rich in fat, sugar and carbohydrates compared to vitamins and proteins promotes overweight or obesity, more so, when less energy is expended compared to that which is consumed. This study proposes that learners and their families should desist from indulging in obesogenic behaviours or practising dietary indiscipline as these have a negative effect on obesity status. Learners need to eat food rich in vitamins and minerals to offset the development of obesity, which among other challenges, results in low self-esteem, teasing by others, mockery and depression. Learners have to strive to develop body structures that do not lead to social isolation, weight, bullying and anxiety. Risky eating behaviours that exacerbate eating disorders should be avoided, especially the purchase of unhealthy foods in school premises. Energy dense, junk, unhealthy and poor nutrient foods are mostly consumed in fast food outlet stores and school vendors (Mandle et al, 2015).

### **6.7.4 Multivariate causes of childhood obesity**

Obesity is caused by multiple factors such as sedentary lifestyle, excessive TV viewing, urbanisation that result in nutrition transition, where cultural foods are less preferred in favour of Western diets. Physical inactivity and social isolation are part of the multitude of causes of obesity. This includes the primary, secondary and tertiary causes of obesity, which also reflects the relationship among psychosocial factors, multivariate causes and the physical reasons. Poor nutrition and the effects of Covid-19 are noted to complicate the cases of obesity. This study suggests multipronged strategies to address obesity challenges such as monitoring the types of food served in school canteens, participating actively in physical activities, reducing use of the internet as well as encouraging walking to and from school.

### **6.7.5 Health/Physical / Physiological consequences**

The excessive dietary intake and low physical activity effectively lead to an energy imbalance in the human body.

It is advised that the eating habits and the engagement of learners in physical activities be controlled and guided to mitigate the effects of obesity. Learners should be encouraged to engage in active physical activity to burn extra calories and increase mental alertness. Families and learners need to be cautious of the food choices they make to ensure they avoid an increased intake of food which leads to the development of obesity. The consumption of excess food has to be balanced with physical activity to burn the stored food. The amount of food that is consumed should be weighed against the rate of energy utilisation in the body to offset the excess accumulation of fat. In this case, learners should be encouraged to participate in school sporting activities and outdoor play rather than spending a lot of time on technological devices and sedentary lifestyle. In this study, is recommended that an increase in the physical activities of learners must be enhanced by raising learner participation, diversifying available activities and closely monitoring learner participation. This should help to reduce BMI, incidents of diabetes, hypertension and cardiovascular diseases.

#### **6.7.6 Learners' poor academic consequences**

The model envisions that improper management of the factors of the environment, including the psychological, social and the physical affect academic performance of learners. This includes the food size, eating pattern and sedentary life style adopted which affect learners 'academics. It is important that the levels of fat in the body be kept in check to realise a positive impact on their academic performance. This has the ability to impair academic performance of learners through social routes such as discrimination, victimisation, bullying, marginalisation, teasing, social isolation and abuse. Obesity also impairs cognitive development, mental alertness and academic engagement. Some learners become sickly such that they constantly require medical reviews and bunk school, which ultimately impact negatively on learner academic performance.

## **6.8 Further Studies**

This study points to the importance of future research on other aspects of the impact of obesity on learner academic performance in rural secondary schools of Mvudi circuit in Vhembe district.

### **The following recommendations are made for future studies:**

- This study interrogated literature indicating that learner obesity in developing countries is associated with high and low family income. It is therefore, desirable to include private schools as an important variable in future studies on the impact of obesity on learner's academic performance.
- The current study explored the perceptions of parents and learners on obesity and the risk factors through the use of closed-ended questionnaires. This implies that the responses of participants were rather limited in approach. However, future studies may utilise focus group interviews with learners and parents to explore their perspectives in-depth.
- In the current study, there is little on the views of health personnel with regard to the causes and the impact of learner obesity on their academic performance. The roles of officials from the Department of Health such as school nurses may be crucial in shedding light on the impact of obesity on learning from an empirical health perspective. Future research studies could use interviews with school nurses to examine their perceptions and attitudes on the impact of obesity on learner academic performance.
- This study had a limited focus on obesity and overweight among learners, with overt exclusion of other stakeholders who are critical in the education of children in secondary schools in Vhembe District. The study also skirted the race issue in the exploratory process. It would be academically interesting to have a future study that considers the race issue, and possibly race differentiation of obesity among learners.

## **6.9 CONCLUSION**

It is concluded that overweight and obesity among learners is a global phenomenon that has not been adequately addressed. The use of qualitative and quantitative approaches was beneficial in the current research which investigated the impact of obesity and overweight on the academic performance of learners in secondary schools. The findings from the quantitative data highlighted important information which needs careful consideration in the education of learners. This includes the observation that learners and parents are prone to underestimate the influence of obesity and overweight in learning. This is a serious negative judgment which is pervasive in the rural areas. In short, this pervasive assessment has a grave impact in hindering efforts to reduce the proliferation of obesity and overweight among learners.

The quantitative part of this study verified and confirmed that learners were bent on pursuing unhealthy lifestyle infused with poor dietary regimes and low physical activity. A majority of learners spent above two hours a day on sedentary activities which included playing video games and watching television. It appears the overweight situation of learners is a long way from the desired remedy as they continue to indulge in unhealthy lifestyles and sedentary behaviours coupled with idleness.

An important finding from the quantitative data which has not been previously examined in the literature in most countries indicates that the rate of overweight among female learners is positively linked to lack of energy expenditure when they transit to school. The point is that female learners rarely walk or ride bicycles to and from school but mostly use vehicular transport. This might be explained in terms of the cultural barriers which are alive in influencing female practices. This phenomenon has been covertly hinted in some contexts, and literature shows that this tendency emerges from the lack of security and government support. In essence, individuals are burdened with the responsibility to grow healthy habits. It is, however, the influences of the surrounding environment which shape the behaviour of individuals. This calls upon the government to play a pivotal function in the promotion of healthy environment to spur learners to adopt healthy living.

Most importantly, it is desirable that interventions to stem obesity and overweight should begin very early in life, as the behaviour of learners are likely to be shaped at that particular period. Once behaviours are developed, even at a tender age, they persist into adulthood. Research demonstrates that the probability of obese young learners becoming obese also at adulthood is quite high. In relation to this, interventions for obesity of learners are basically health care interventions such as proper eating patterns coupled with healthy eating and physical activeness.

The qualitative findings of this study raised another important and unique issue which might lead to the attainment of positive outcomes when adopted by the government. This pertains to the fact that schools renege on supporting learners developing healthy physical practices and dietary tendencies. Schools tend to offer learners food that is unhealthy because of the high sugar and fat content. There are also limited dietary options from which learners to choose to evade eating unhealthily. Research indicates that learners who purchase food from canteens experience increased risk of getting obese compared to those that carry boxed lunch from home. It is therefore, imperative that schools should stock healthy foods in canteens as a strategy and crucial step towards enhancing the dietary habits of learners.

In addition, not enough physical activities were conducted in schools to assist learners to reduce their weight. The discussions with school teachers through interviews, showed that the PE lessons which were offered failed to help learners to stay active. This contradicted literature which suggests that participation in physical activity in schools has a positive association with learners obtaining a weight that is considered healthy. Similarly, learners who are active in school tend to retain a normal weight in general life. This is in contradiction with some studies which present activities of nurses as associated with the development of healthy lives of learners, such as the delivery of health education and capturing their body weights. Teachers also serve a special role as they advocate for the creation of environments that are healthy for learners. Therefore, this current study advocates for the use of teachers as a part of a solution against obesity and overweight.

Finally, the study identified the Government, parents and teachers as significant role players in leading the struggle against overweight and obesity among learners. It is reasonable to think that there is no strategy or programme that can operate profitably without the support of government. The ability to solve the problem of learner obesity has prospects of reducing health pressure from individuals, the economy and the society at large. However, the findings from this study show that the government is not doing enough to tackle the obesity challenge as it does not have policies in place for school vendors and canteens. This is evidenced by the meagre initiatives rolled out by the government to curb the negative impact of obesity on learner academic performance.

Furthermore, the continued availability of unhealthy food at the school canteens indicate the failure of the government to practice its constitutional power to combat the problem of obesity in education of learners, with particular reference to Vhembe District in Limpopo province. Obesity is believed to impact negatively on learners' academic performance which resulted in Limpopo province being the last and least performing province of the nine others in South Africa in the Grade 12 results. It should be noted that schools play an important role in designing eating patterns of school learners. Since learners were attending schooling in a yo - yo pattern, this might have compromised their learning as they were secluded from their teachers, peers and study mates in the learning environment. Vhembe district as a rural based district, families do not have may not afford to pay for facilities that can assist their children to attend through ZOOM which led to poor academic performance among Grade 12 learners.

Research shows that victims of obesity bullying, teasing, isolation and mockery turn into very unhappy learners and suffer from anxiety and stress. Subsequently, they try to evade school and social interactions, to escape the obesity bullying. Bullied obese learners are likely to display more absenteeism from school than their non – obese counterparts. This may lead to bullied obese learners' performance dropping down to such an extent that they become unable to do schoolwork. Obesity related bullying and teasing among school learners creates a hostile environment that is not conducive to learning and extremely harmful to the health, psycho – social well-being, and the academic progress of the obese bullied learners.



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## ANNEXURE 1



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FACULTY OF EDUCATION

Cell: 0729116600

Date: 31 January, 2022

TO WHOM IT MAY CONCERN

### CERTIFICATE OF EDITING

I, **Muchativugwa Liberty Hove**, confirm and certify that I have read and edited the entire thesis, **IMPACT OF OBESITY ON LEARNER ACADEMIC PERFORMANCE IN RURAL SECONDARY SCHOOLS IN VHEMBE DISTRICT**, submitted by **THENGA NWAKWANA EMILY**, student number **201860878**, in fulfilment of the requirements for the degree of **DOCTOR OF EDUCATION** in the **DEPARTMENT OF EDUCATIONAL PSYCHOLOGY, SCHOOL OF EDUCATION UNIVERSITY OF ZULULAND**

**THENGA NWAKWANA EMILY** was supervised by **Professor D.R. NZIMA** and co-supervised by **Professor A. P. KUTAME**.

I hold a PhD in English Language and Literature in English and am qualified to edit such a thesis for grammatical correctness, cohesion and coherence. The views expressed herein, however, remain those of the researcher/s.

Yours sincerely

**Professor M.L. Hove (PhD, MA, PGDE, PGCE, BA Honours – English)**



## ANNEXURE:2

**UNIVERSITY OF ZULULAND  
RESEARCH ETHICS COMMITTEE**  
(Reg No: UZREC 171110-030)



### RESEARCH & INNOVATION

Website: <http://www.unizulu.ac.za>  
Private Bag X1001  
KwaDlangezwa 3886  
Tel: 035 902 6731  
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Email: DlelanaM@unizulu.ac.za

### ETHICAL CLEARANCE CERTIFICATE

Certificate Number	UZREC 171110-030 PGD 2019/284								
Project Title	IMPACT OF OBESITY ON LEARNER ACADEMIC PERFORMANCE IN RURAL SECONDARY SCHOOLS IN VHEMBE DISTRICT								
Principal Researcher/ Investigator	Emily N. Thenga								
Supervisor and Co- supervisor	Prof A.P Kutame								
Department	Educational Psychology								
Faculty	Education								
Type of Risk	Med Risk – Data collection from people								
Nature of Project	Honours/4 <sup>th</sup> Year		Master's		Doctoral	x	Departmental		

The University of Zululand's Research Ethics Committee (UZREC) hereby gives ethical approval in respect of the undertakings contained in the above-mentioned project. The Researcher may therefore commence with data collection as from the date of this Certificate, using the certificate number indicated above.

- Special conditions:
- (1) This certificate is valid for 1 year from the date of issue.
  - (2) Principal researcher must provide an annual report to the UZREC in the prescribed format [due date – 25 July 2020]
  - (3) Principal researcher must submit a report at the end of project in respect of ethical compliance.
  - (4) The UZREC must be informed immediately of any material change in the conditions or undertakings mentioned in the documents that were presented to the meeting.

The UZREC wishes the researcher well in conducting research.

  
Professor Gideon De Wet  
Chairperson: University Research Ethics Committee  
Deputy Vice-Chancellor: Research & Innovation

**CHAIRPERSON**  
UNIVERSITY OF ZULULAND RESEARCH  
ETHICS COMMITTEE (UZREC)  
REG NO: UZREC 171110-30

26-07-2019

RESEARCH & INNOVATION OFFICE

26 July 2019

## ANNEXURE 3



LIMPOPO

PROVINCIAL GOVERNMENT  
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF  
EDUCATION

VHEMBE DISTRICT

REF: 14/7/R

ENQ : MATIBE M.S

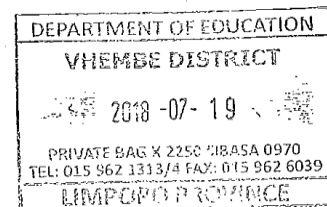
TEL : 015 962 1029

MS THENGA NE

P.O.BOX 178

THOHOYANDOU

0950



REQUEST FOR PERMISSION TO COLLECT DATA

1. This serves to inform you that your request to collect data in schools in the Vhembe District for the purpose of conducting a research study entitled " Impact of learner obesity on the academic performance in rural secondary schools in the Vhembe District "has been granted.
2. You are expected to ensure that your interactions with teachers and learners will not disrupt teaching and learning activities.
3. Kindly inform the circuit managers and principals of selected schools prior to visiting your research subjects.
4. Wishing you the best in study.

DISTRICT DIRECTOR

19/07/2018  
DATE

Thohoyandou Government Building, Old Parliament, Block D, Private Bag X2250, SIBASA, 0970  
Tel: (015) 962 1313 or (015) 962 1331, Fax: (015) 962 6039 or (015) 962 2288

The heartland of southern Africa - development is about people

## **ANNEXURE 4**

### **INFORMATION SHEET**

#### **INTRODUCTION**

I am Thenga Nwkwana Emily, a doctoral student currently enrolled for my Doctoral degree in Educational Psychology at the University of Zululand in the Faculty of Education. In partial fulfilment for this degree, I am requested to conduct a research project.

**The title of my thesis is:** *IMPACT OF OBESITY ON LEARNER ACADEMIC PERFORMANCE IN RURAL SECONDARY SCHOOLS IN VHEMBE DISTRICT.*

I am requesting for permission from you to participate in this study by expressing your views on the topic outlined above:

For you to make an informed decision on this, you need to have a full knowledge and understand on what the study is all about and how participants are to be involved. Should you have any question to ask feel free to call me on the following number: 071 278 4426 You are reminded that participation is entirely based on voluntarily basis, therefore no one will take part in the research until he/she understand what the research is all about and happy about what he/she going to do in the study.

#### **Aim of the Study**

- To assess the impact of obesity on learner academic performance in rural secondary schools in the Mvudi Circuit of Vhembe District, Limpopo Province, South Africa.

#### **Objectives of the Study**

**The study sought to achieve the following objectives, designed to:**

- Assess the impact of obesity on learners' academic performance in rural secondary schools in the Mvudi circuit of Vhembe District.
- Identify the causes of obesity among learners in rural secondary schools in Mvudi circuit of Vhembe District.

- Determine the effects of obesity on learner academic performance in rural secondary schools in Mvudi circuit of Vhembe District.
- Explore and interrogate the perceptions of learners on obesity in relation to academic performance in rural secondary schools in Mvudi circuit of Vhembe District.

### **Outline of the procedure:**

Data was collected through interview sessions that were last 60 min. Participants are required to give consent of participation prior data collection.

### **Who can be included in the sample?**

The study was carried out in Vhembe District.

Participants should be attached to one of the sampled rural secondary schools within the district. Teachers should be employees teaching either grade 10 or 11

### **Is participation mandatory? / How will they participate?**

Participants will participate voluntarily and nobody was forced to participate in the study. Every participant has the right to withdraw from the study anytime without having to explain why they no longer wish to participate. There were no negative consequences to the participants who wish to withdraw from the study.

### **Will the research impact the schools?**

I have applied for permission at the Limpopo Department of Basic education to collect data from the sampled rural secondary schools.

### **Risks or discomfort to the participants.**

There are no foreseeable health or safety risks and discomfort anticipated, the researcher will phrase the wording that will not cause psychological harm. If anyone think they have anything important on this study, that he cannot say it out, He/she can write it and put it in school suggestion box, without indicating his/her name. Also that the study is not about anyone's private life, but views on the effect of obesity on learners' academic performance.

### **Will the participants be remunerated for being part of the study?**

Participants will not receive any monetary or other types of remuneration.

### **Benefits of the study**

The study's might create awareness about the effects of obesity on learners, reduce obesity among children and health related illnesses. It is my presumption that that the research findings will make a credible contribution towards alleviating and alerting other children to stop inflicting the psychological and social pain to their obese peers that can lead to academic underperformance due to stigmatisation and bullying.

### **Who is funding the research? / Costs of the study**

The study is done and funded by me under the supervision of Prof. A.P Kutame and Prof. D.R Nzima from the University of Zululand.

### **Is participation confidential?**

The names of the participants as well as their schools will never be disclosed instead pseudonyms were used. Only statistician and the independent data analyst will have access to the information provided by the participants.

### **Ethical views of the University of Zululand**

It is very important that the ethical views of the University of Zululand are respected at all times. The ethical considerations of was respected throughout the study all times. This includes that I subscribe to the **principles of**:

- **Voluntary participation** in research: implying that participants can withdraw from the research at any time if they wish to.
- **Informed consent**: meaning that research participants must all times be fully informed about the research processes and its aims, and must give consent to their participation in the study.
- **Safety in participation**: implying that human participants should never be at risk or harm of any kind. e.g. researching with young children or mentally sick people. This will never happen in this study.
- **Privacy**: meaning that the confidentiality and anonymity of human respondents is protected always.

- **Trust:** meaning that human respondents will not be subjected to any acts of deception or betrayal in the research process or its publication.



## ANNEXURE 5

### INFORMED CONSENT

I ----- hereby confirm and agree that I have been fully informed about the purpose, procedure and activities of the study. The rights and the risk of the study to the participants has been fully explained to me. I was given enough opportunity to ask and understand that participants can withdraw at any stage of the study without giving any reason nor without penalty and participation is entirely voluntary.

#### Consent

I hereby freely give/do not give (delete the inapplicable), my consent as an indication of voluntarily taking part in the study as outlined.

Participant Signature: ----- Date: -----

-

Researcher's Signature: ----- Date: -----

-

## ANNEXURE 6

### QUESTIONNAIRE

I am Thenga Nwkwana Emily, a Doctoral student enrolled at the University of Zululand in the Faculty of Education. I am involved in research that tries to answer some questions with regard to *the Impact of obesity on learner academic performance in rural secondary school in Vhembe district*. Do not write down your name on the questionnaire. Please answer these questions as honestly as possible.

#### SECTION A: BIOGRAPHICAL INFORMATION (*Please complete all questions*)

##### 1. Gender of the respondents

Male	
Female	

##### 2. Age distribution of the respondents

13-15 years	
16-18 years	
19-21 years	
Over 22 years	

##### 3. In which grade are you?

Grade 10	
Grade 11	

#### SECTION B: THE PREVALENCE OF CHILDHOOD OBESITY ON LEARNERS' ACADEMIC PERFORMANCE IN RURAL SECONDARY SCHOOLS

ITEMS	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
1. How prevalent is obesity among learners in rural secondary schools?	1	2	3	4	5
2. Obesity is higher among black South African females than males.	1	2	3	4	5
3. Plateauing prevalence of physical inactivity and obesity causes academic underachievement.	1	2	3	4	5
4 Obesity is associated with hypertension	1	2	3	4	5
5. Urbanisation and sedentary lifestyle expose South African learners to the risk of obesity.	1	2	3	4	5
6. There is an increase in childhood obesity between 2010 and 2017.	1	2	3	4	5

### SECTION C: THE CAUSES OF OBESITY AMONG LEARNERS IN RURAL SECONDARY SCHOOLS

ITEMS	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
1. Technology limits learners' participation in physical activities.	1	2	3	4	5
2. COVID 19 related lockdown causes obesity and education underperformance	1	2	3	4	5
3. Obesity causes health problems and underperformance	1	2	3	4	5
4 Poor nutrition intakes linked to obesity hampers academic performance	1	2	3	4	5
5. Learners can suffer from obesity related illnesses	1	2	3	4	5
6. Obesity increases the risk of premature death	1	2	3	4	5
7. Obese learners are stigmatised in schools	1	2	3	4	5
8. Obese learners are prone to depression and anxiety	1	2	3	4	5
9. Obese learners perform academically poor at school.	1	2	3	4	5
10. Obesity related teasing affect academic performance of obese learners at school	1	2	3	4	5
11. Obese learners have difficulty socialising with peers	1	2	3	4	5
12. Obese learners may think of committing suicide	1	2	3	4	5
13. Obesity contributes to peer rejection and academic underperformance.	1	2	3	4	5
14. Obese learners have lower self-esteem and social skills	1	2	3	4	5
15. Obesity has economic consequences.	1	2	3	4	5
16. Obesity is associated with poor quality of life.	1	2	3	4	5
17. Obesity results in grade retention.	1	2	3	4	5
18. Obese learners are absent from school more than normal weight counterparts.	1	2	3	4	5

### SECTION D: PERCEPTIONS OF LEARNERS ON OBESITY

Indicate the extent to which you **agree** or **disagree** with each of the following statements about the Perception of obesity on learner academic performance in rural secondary schools in Vhembe District.

ITEMS	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
1. Obese learners are perceived as untidy and less able	1	2	3	4	5
2. Obesity is associated with few friends and being stupid.	1	2	3	4	5

**Thank you!!!!!!!!!!!!!!**

## ANNEXURE 7

### INTERVIEW QUESTIONS

The interviews for the research were formulated as follows

The purpose of this interview guide is to gain knowledge and insight on the impact of obesity on learner academic performance in rural secondary school in Vhembe district.

A: Participants' information

Age.....

Gender.....

Grade currently teaching/ Grade currently attending .....

B: The impact of obesity on learner academic performance in rural secondary school in Vhembe district

How prevalent is obesity in your schools?

.....  
.....  
.....  
.....

Who seem to be obese between boys and girls? Why?

.....  
.....  
.....

Which obesity factors impact learners' academic performance in rural secondary schools?

.....  
.....  
.....  
.....

Do obese learners experience social isolation at school?

.....  
.....  
.....  
.....

What are the consequences of obesity on learner academic performance?

.....  
.....  
.....

.....  
.....

Are obese learners stigmatised and bullied?

.....  
.....  
.....  
.....

To what extent can obesity affect learner's academic performance?

.....  
.....  
.....  
.....

**Thank you for your partaking!!!!!!!!!!!!!!!!!!!!**

Enq: 071 278 4426

P. O. Box 178

Thohoyandou

0950

16 JULY 2018

The District Senior Manager

Vhembe District Directorate

Department of Education

Thohoyandou

0950

Dear Sir /Madam

#### **REQUEST FOR PERMISSION TO COLLECT DATA**

I Thenga Nwakwana Emily of student No. 201860878, a Doctoral student at the University of Zululand am currently intending to conduct a research study titled: **“IMPACT OF OBESITY ON LEARNER ACADEMIC PERFORMANCE IN RURAL SECONDARY SCHOOLS IN VHEMBE DISTRICT”**. The aim of the study is to assess the impact of obesity on learner academic performance in rural secondary schools in Vhembe District.

I therefore request for permission to conduct research in selected secondary schools under your jurisdiction. I undertake to make every effort to ensure participant anonymity, and maintain confidentiality and ensure voluntary participation of the research subjects. All participants will be required to give written informed consent prior to interview or completion of questionnaires.

For further information about the study, please contact my: Supervisor/Co-Supervisor Prof. A. P Kutame (072 056 3658) and Prof. D.R Nzima

Thanking you in anticipation.

Yours Faithfully

-----  
**Nwkwana Emily Thenga**

**Enq: 071 278 4426**

**P. O. Box 178  
Thohoyandou  
0950  
16 JULY 2018**

**The Circuit Manager  
Mvudi Circuit offices  
Department of Education  
Makwarela  
0950**

**Dear Sir /Madam**

**REQUEST FOR PERMISSION TO COLLECT DATA**

I Thenga Nwkwana Emily of student No. 201860878, a Doctoral student at the University of Zululand am currently intending to conduct a research study titled: **“IMPACT OF OBESITY ON LEARNER ACADEMIC PERFORMANCE IN RURAL SECONDARY SCHOOLS IN VHEMBE DISTRICT”**. The aim of the study is to assess the impact of obesity on learner academic performance in rural secondary schools in Vhembe District.

I therefore request for permission to conduct research in selected secondary schools under your jurisdiction. I undertake to make every effort to ensure participant anonymity, and maintain confidentiality and ensure voluntary participation of the research subjects. All participants will be required to give written informed consent and or assent prior to interview or completion of questionnaires.

For further information about the study, please contact my: Supervisor/Co-Supervisor(s) Prof. A. P Kutame (072 056 3658) and Prof. D.R Nzima



Thanking you in anticipation.

Yours faithfully

-----

Nwakwana Emily Thenga

Enq: 071 278 4426

P. O. Box 178

Thohoyandou

0950

16 JULY 2018

The School Principals

Department of Education

Thohoyandou

0950

Dear Sir /Madam

#### **REQUEST FOR PERMISSION TO COLLECT DATA**

I Thenga Nwakwana Emily of student No. 201860878, a Doctoral student at the University of Zululand am currently intending to conduct a research study titled: **“IMPACT OF OBESITY ON LEARNER ACADEMIC PERFORMANCE IN RURAL SECONDARY SCHOOLS IN VHEMBE DISTRICT”**. The aim of the study is to assess the impact of obesity on learner academic performance in rural secondary schools in Vhembe District

I therefore request for permission to conduct research as your school has been selected where I will request for your teachers and learners under your supervision to be part of the study population. I undertake to make every effort to ensure participant anonymity, and maintain confidentiality and ensure voluntary participation of the research subjects. All participants will be required to give written informed consent prior to interview or completion of questionnaires.

**For further information about the study, please contact my: Supervisor/Co-Supervisor(s) Prof. A. P Kutame (072 056 3658) and Prof. D.R Nzima**

**Thanking you in anticipation.**

**Yours faithfully**

-----

**Nwakuwana Emily Thenga**



LIMPOPO

PROVINCIAL GOVERNMENT  
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF  
EDUCATION

VHEMBE DISTRICT

REF: 14/7/R

ENQ : MATIBE M.S

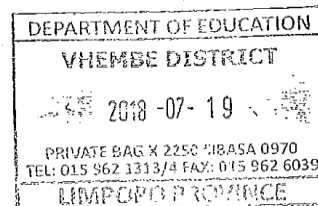
TEL : 015 962 1029

MS THENGA NE

P.O.BOX 178

THOHoyANDOU

0950



REQUEST FOR PERMISSION TO COLLECT DATA

1. This serves to inform you that your request to collect data in schools in the Vhembe District for the purpose of conducting a research study entitled " **Impact** of learner obesity on the academic performance in rural secondary schools in the Vhembe District "has been granted.
2. You are expected to ensure that your interactions with teachers and learners will not disrupt teaching and learning activities.
3. Kindly inform the circuit managers and principals of selected schools prior to visiting your research subjects.
4. Wishing you the best in study.

DISTRICT DIRECTOR

19/07/2018  
DATE

Thohoyandou Government Building, Old Parliament, Block D, Private Bag X2250, SIBASA, 0970  
Tel: (015) 962 1313 or (015) 962 1331, Fax: (015) 962 6039 or (015) 962 2288

The heartland of southern Africa - development is about people