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Food Insecurity Versus Learners' Performance in the Classroom: A Case of South African Rural School

Michael Mbongiseni Buthelezi*[a], Lusanda Ncisana[b], & Mohammed Xolile Ntshangase[a]

* Corresponding author
Email: michael.buthelezi@ul.ac.za

a. Department of Educational Studies, University of Limpopo, South Africa
b. Department of Mathematics, Science, Technology Education, University of Limpopo, South Africa.

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ABSTRACT

Food insecurity is one of the less researched problems that poses a challenge to schools in South Africa. This qualitative study seeks to holistically explore this problem as it adopts Maslow's hierarchy of needs and Vygotsky's sociocultural theory as the lenses of exploration. In addition to socio-cultural beliefs on food and academic achievement, Maslow and Vygotsky offer a framework for physiological and cultural theories of how food impacts human brain function and capability. Therefore, this study's primary goal is to investigate the connection between food insecurity and academic achievement in rural South African schools, such as Tshehlo Secondary School in the Capricorn region of the province of Limpopo. Methodologically, this study purposively sampled grade 10,11, and 12 learners from Tshehlo secondary school for focus group discussions, observations, semi-structured interviews, and surveys from top to low achievers. The data collected were thematically analysed as they show that there is a link between food insecurity and learners' performance in classrooms. Data was analysed to compare the experiences of top and low-performing learners with food insecurity and how it affects their performance in the classroom. Objectives of this study are; (a) to explore the effects of food insecurity on learners' concentration and attention in the classroom, (b) to explore the impact of food insecurity on learners' academic achievements, (c) to explore the relationship between food insecurity and learners' performance in the classroom, (d) to explore any comparative difference between learners from food secure background and those who come from food insecure homes in terms of academic success. Recommendations thereof significantly include (a) devising ways to ensure food security programs in schools, (b) counselling and motivation in schools, and (c) DBE policy development and enforcement which involves even NGO's with regards to learners' nutrition. Conclusion entails that food security is more important for high quality achievements in schools as it directly impacts learners' attitudes towards learning. Furthermore, it is challenging to evaluate the long-term educational effects of food poverty because a large number of the research are cross-sectional rather than longitudinal in character.

KEYWORDS
Food insecurity; academic performance; rural schools; hunger; learners' success

INTRODUCTION

Food insecurity remains a pressing global challenge, making access to sufficient, safe, and nutritious food more urgent than ever (Ncisana et al., 2024). It directly threatens the achievement of Sustainable Development Goal (SDG) 2: Zero Hunger by 2030 (Ncisana et al., 2024; Ncisana et al., 2023). In South Africa and other Southern African Development Community (SADC) countries, food production and security remain major concerns (Statistics South Africa, 2017). Food insecurity occurs when individuals lack access to adequate nutrition necessary for a healthy life (Chakona & Shackleton, 2019; Gallegos, et al., 2023). Sustainable food systems depend on four key pillars: accessibility, availability, utilization, and stability (Gallegos, et al., 2023; World Food Programme, 2019). A major challenge to addressing food insecurity in South African public schools is the delayed payment of service providers, which hinders the effective implementation of school feeding programs (Mafugu, 2021). Rising food costs further worsen the situation, disproportionately affecting disadvantaged communities (Food and Agricultural Organisation, 2008). Rural provinces such as Limpopo and the Eastern Cape are particularly vulnerable due to persistent poverty and inequality, stemming from historical policies and geographic disparities (Mbajiorgu & Odeku, 2023). Children in the Eastern Cape and Limpopo had the greatest rates of multidimensional poverty (78.7% and 82.8%, respectively), according to the 2020 publication Child Poverty in South Africa: A Multiple Overlapping Deprivation Analysis. As a result, they are more susceptible to food insecurity (Maluleke, 2020).

Beyond its immediate impact on health, food insecurity significantly affects education by undermining cognitive development and academic performance. According to Maslow's hierarchy of requirements, learning and other higher-level cognitive processes cannot take place until basic physiological demands, like nourishment, are satisfied. Children who are hungry have trouble focussing and remembering information, which affects their test results and level of involvement in school (Brown et al., 2023; Nazmi et al., 2019;). In a similar vein, Vygotsky's sociocultural theory emphasises the value of social interaction in education and contends that undernourished kids are less likely to participate and have energy in group learning settings. Deficits in nutrition also affect memory, attention, and cognitive function, which makes it harder for students to absorb and remember information (Fynn, 2024). Payne-Sturges et al., (2018) compare food in education to fuel in a vehicle without adequate nourishment, learners cannot function effectively. To address this issue, initiatives such as school feeding programs have been introduced. The World Food Programme (WFP) advocates for these programs as a critical solution to reduce hunger, improve nutrition, and enhance educational outcomes. The National School Nutrition Programme was carried out in South Africa by the Department of Basic Education (DBE) (Education Law and Policy, 1999). Nonetheless, teachers still observe a high rate of food insecurity among students, with many going to school mainly for food rather than instruction (Martin et al., 2022). Research conducted in the United States (US) shows that children who are malnourished have more health issues, shorter attention spans, and lower attendance than their peers who are well-nourished (Gallegos et al., 2021). There isn't much

research on food insecurity in southern Africa, despite the clear connection between it and education. Thus, the purpose of this study is to investigate the connection between academic achievement and food insecurity at Tshehlo Secondary School in the Capricorn District of the Limpopo Province, South Africa.

Problem Statement

Many students arrive at school hungry because of South Africa's high rates of poverty. According to research by Blanchet et al., (2020), students who are food insecure are more likely than their classmates who are food secure to have lower academic success, lower test scores, and higher absenteeism rates. Food insecurity impacts a learner's overall wellbeing, and it negatively impacts the learners' school engagement (Cohen et al., 2021). Hence the World Food Programme (WFP) advocated school feeding schemes to assist the government prioritize reducing hunger, poverty, improving nutrition, and education. Similar to Cohen et al., (2021), this study argues that food insecurity has to be considered as a pressing concern affecting learners` academic performance worldwide. Food insecurity affects a significant section of the population in South Africa, which hinders educational progress and equity (Sabi et al., 2018). Despite the startlingly high rate of food insecurity among students, no thorough research has been done on how it affects academic performance (Buthelezi et al., 2024). Therefore, the primary goal of this study is to investigate the connection between students' academic performance and food insecurity. This is consistent with the primary inquiry of this study, which is: What is the impact of food insecurity on students' academic performance?

The relationship between hunger and learning is complex, with malnourished learners often displaying poor memory retention and poor critical thinking skills which further exacerbate academic disparities (Gerber et al., 2021). According to Gerber et al., (2021), school principals' main responsibility is to make sure students are actively participating in their education. In fact, October (2023) makes the case that principals ought to support educators in empowering students to enquire, find, and discuss new information through student-led activities. However, putting these techniques into practice in rural schools may prove challenging due to the higher rates of absenteeism, academic disengagement, and decreased general welfare among students experiencing food hardship. Therefore, this research's aim of exploring the relationship between hunger and learners' performance in classrooms includes producing strategies to seek assistance from Non-Governmental Organizations (NGOs) and other sponsors to assist families of food insecure learners. The connection between food insecurity and academic achievement in South African rural schools has not yet been investigated in any research. Early childhood has been the primary focus of previous studies on the connection between food insecurity and academic achievement (Perez-Escamilla & Pinheiro de Toledo Vianna, 2012). Food instability has been prospectively linked to poorer mental competency in toddlers (Zaslow et al., 2009), low standardised test scores in school-aged children (Faught et al., 2017), and poor reading and arithmetic performance (Jyoti, 2005). One important mediator of this link is thought to be the psychological and emotional stress that frequently follows the experience of food insecurity

(Faught et al., 2017). Psychosocial factors have been reported to mediate the relationship between food insecurity and a number of health outcomes, such as weight status (Willis & Fitzpatrick, 2016) and sleep quality (Bermudez-Millan et al., 2016), despite the fact that few research have specifically examined this concept. Examining the connection between hunger and students' academic performance could aid in clarifying the intricate processes that most likely behind the preliminary findings linking food insecurity to worse health and academic results.

LITERATURE REVIEW

A basic human right, having food and nutrition security means that every individual has physical, social, and financial access to safe food, consumed in sufficient quantity and quality to meet their dietary requirements and food preferences for an active and healthy lifestyle (Cook & Frank, 2008). As noted by Jordan et al., (2016), food insecurity refers to the restricted or uncertain availability of safe, nutrient-rich foods or the restricted or uncertain capability to obtain acceptable foods in socially acceptable ways (e.g., without resorting to emergency food supplies, scavenging, stealing, or other coping mechanisms). Food insecurity occurs when people do not have reliable access to enough safe and nutritious food to meet their dietary needs for a healthy life (Chakona & Shackleton, 2019). A sustainable food system is built on four essential pillars: accessibility, availability, utilization, and stability (Gallegos et al., 2023; World Food Programme, 2019). Adeomi et al. (2022) claim that food insecurity has a detrimental effect on students' school involvement in addition to their general well-being. According to Ferrira et al., (2024), school engagement is characterised by students' regular participation in class activities and their sense of belonging to the school's environment and values. Food insecurity may have an impact on a child's energy levels and psychological health (Wrottesley et al., 2023). Furthermore, a study by Devereaux et al. (2018) offers actual proof that shows children who experience food insecurity are docile, less motivated, indifferent, and unsympathetic to their surroundings.

Several studies have shown that food insecurity can lead to poor academic performance, lower attendance rates, and increased dropout rates among learners. For example, a study by Zizzamia (2020), conducted at the University of KwaZulu-Natal (UKZN) found that food insecure learners are more likely to have lower grades and poor cognitive function. Another study by the Human Science Research Council found that learners receiving school feeding programs had improved attendance compared to those who did not (Appiah, 2024). This proves the findings by Tagoe (2018) which argued that food insecure learners get motivated to go to school just to be fed instead of learning. This growing body of research highlights the importance of addressing food insecurity to improve educational outcomes.

In order to address the issues of food insecurity and a well-balanced diet meal in schools and enhance student performance, this study aims to investigate potential treatments. Mohammed et al. (2023) assert that dietary quality has a greater impact on academic achievement than

socioeconomic considerations. Furthermore, it's possible that the nationwide school lunch programs' food isn't nutritious enough to negate the long-term impacts of food insecurity (Mohammed et al., 2023). According to a study by Batistela et al. (2022), children who participate in national school lunch programs do not see a substantial improvement in their vitamin and mineral consumption, which has little effect on children who are food insecure. These results are also supported by Sanlier et al. (2024), who found that, even in cases where food help is received, there is a robust correlation between low food consumption and food insecurity.

At first, school feeding programs were marketed as an anti-hunger initiative. Few researchers, such as El Harake et al. (2018), discovered a relatively small effect on children's cognitive performance in relation to nutritional deficiencies, but later research has demonstrated that even a brief absence of critical meals like breakfast can impair verbal fluency, concentration, and the ability to remember new information (Sanlier et al., 2024). Therefore, the study's results can inform the development of programs aimed at reducing poverty and food insecurity, such as food assistance initiatives, or nutrition education programmes. For example, school feeding schemes in secondary schools to consider providing daily breakfast to their learners to improve their cognitive performance as benefits of a good breakfast for a child have been illustrated by Appiah (2024). According to Abraham Maslow's 1943 hierarchy of wants, human needs are arranged from most basic to most complex. Maslow's hierarchy of needs includes the following clusters of requirements in order of increasing importance: safety needs, esteem needs, self-actualization needs, belongingness and love needs, and physiological needs. The body's physiological need for food is explained by Maslow (1943), particularly with regard to preserving circulatory temperature, water, salt, macronutrients, vitamins, and minerals. Of all the demands, these physiological needs are without a doubt the most pre-potent. All other needs may simply cease to exist or be pushed to the side if all of the needs are not met and the body is then controlled by the physiological demands because hunger almost entirely preempts consciousness. For a man who is consistently and severely hungry, food seems to define life itself. Everything else will be deemed irrelevant. Achievement is one of the least powerful demands, in contrast to the directing power of food. Maslow (1943) asserts that everyone in our culture has a need or desire for self-esteem that is firmly grounded on actual ability, accomplishment, and respect from others. It's crucial to remember Maslow's theory, which holds that after demands at one level are met, needs at other levels surface and take over an organism's thoughts and actions. Therefore, in accordance with Maslow's hierarchy, a person's thoughts and behaviours will not be motivated by the need or desire for achievement until the lower-level demands have been met. Therefore, it is impossible to attain the cognitive processes and behaviours linked to the higher levels of the hierarchy; learners who are deprived of their basic requirements cannot be expected to perform well academically. However, Vygotsky's insightful analysis of the sociocultural dynamics relevant to this subject provides another level of comprehension. Nutrition and academic performance are influenced by a variety of social

factors. Both internationally and within demographic subcultures, there are discernible differences in nutrient consumption due to food availability, tastes, and social norms; these dietary trends are most apparent when comparing socioeconomic status and ethnicity. Similarly, there are significant cultural and subcultural differences in academic achievement. Learning priorities and eating habits are two examples of how learners' context impacts their conduct. To put it briefly, Maslow and Vygotsky give a framework for physiological and cultural theories of how food influences human brain abilities and function as well as societal perceptions of food and academic achievement. The purpose of this study is to investigate the connection between academic achievement and food insecurity at Tshehlo Secondary School in the Capricorn District of the Province of Limpopo, South Africa.

This study aims to fill a significant gap in the body of knowledge regarding how food insecurity affects academic performance. By investigating how food insecurity affects students' performance, this study seeks to provide policymakers, educators, non-governmental organisations, and medical experts with information regarding specific interventions that can help students who are food insecure. According to Baugus (2020), effective interventions can improve academic outcomes, reduce behavioural problems, and promote overall wellbeing among vulnerable learners.

Moreover, this research aims to explore the specific cognitive and physical effects that result from food insecurity and how they influence learners' engagement and performance in the school. As stated by Baugus (2020), research suggests that learners who do not have reliable access to nutritious food often exhibit lower energy levels, higher absenteeism, and weaker cognitive abilities, which negatively affect their classroom performance. This study will analyse data from Tshehlo Secondary School to identify patterns in learner performance linked to food insecurity, providing feedback on how poor nutrition and lack of regular meals undermine academic outcomes. By doing so, the research does not only aim to investigate the relationship between food insecurity and performance of learners in the classroom but also provide educators and policymakers with a clear understanding of the importance of addressing food insecurity within the education system.

The results of this study also aim to suggest strategies and policy changes that schools might use to lessen the negative effects of food poverty on student performance. Even though food insecurity is a socioeconomic problem, schools are essential in helping students by providing feeding programs and other forms of assistance. Understanding the clear connections between food insecurity and student performance will enable the creation of focused interventions, such increased school lunch programs, which may enhance both academic performance and the wellbeing of students (Leshabana, 2022). As a result, the research's conclusions will not only add to the body of knowledge but also provide workable ways to lessen the detrimental effects of food insecurity on schooling.

Significance of the study

The purpose of this study is to ascertain whether hunger and student performance in the classroom are directly related. Food impoverished students are more likely to do poorly on standardised tests and in the classroom due to the connection between food insecurity and poor physical and mental health (Omoniyi et al., 2022). The study's results will inform educators, sponsors, and policymakers about the need for targeted interventions to be prioritized to support food-insecure learners. Research by (Omoniyi et al., 2022) has shown that food insecurity negatively impacts cognitive function, memory, and concentration, leading to decreased academic achievement. Teachers can create efficient plans to lessen the impact of food insecurity by knowing how it relates to academic achievement. To guarantee that students have access to wholesome meals, for example, schools can introduce breakfast programs or food assistance efforts (Critch, 2020). Cognitive abilities such as memory, focus, and critical thinking can all be adversely impacted by food hardship. Studies by Alcantara and Frontreras (2024); Mafugu (2021) have shown that my nutrition and hunger can lead to decreased concentration and lower academic achievements. By focusing on classroom performance, this study will investigate academic challenges faced by food insecure learners.

Schools play a crucial role in addressing food insecurity through programs such as feeding initiatives. Research indicates that providing consistent, nutritious meals can significantly improve academic performance and overall wellbeing of a learner (Wineman et al., 2022). By providing empirical data on the impact of food insecurity on learner performance in the classroom, this study aims to inform the policymakers to use these findings to advocate for increased funding and support for school-based nutrition programs and their interventions aimed at reducing food insecurity. Lastly, the study's significance lies in its potential to influence public policy by providing empirical evidence on the adverse effects of food insecurity on education. Policymakers can use this evidence to advocate for comprehensive programs that support both nutritional and educational needs of learners. According to Wineman et al., (2022), framing food insecurity as not only a health issue but also an educational challenge is a holistic approach, the study encourages a multi-sectoral approach to tackling poverty, particularly where food scarcity disproportionately affects children.

THEORETICAL FRAMEWORK

It is proposed that a person has a hierarchy of requirements that must be met before achieving self-actualisation, in accordance with Maslow's hierarchy of needs (Maslow, 1943). Meeting one's psychological needs which include biological need for human survival like consuming enough food is the first stage. People find it challenging to concentrate on higher level demands, like learning and academic success, if these basic wants are not satisfied. Nonetheless, research has shown that children experiencing food insecurity are unable to achieve these fundamental demands, which is why their poor academic performance is so high. If students' basic nutritional needs are not satisfied, they could find it difficult to focus, participate in class activities, or think

clearly in the classroom. Therefore, the foundation required for students to flourish academically is disrupted by food hardship.

Vygotsky's Sociocultural Theory, which highlights the importance of social interaction and environment in learning, is another pertinent theory. Food insecurity, which is frequently associated with poverty, can lead to stressful situations that impair a child's capacity to learn (Vygotsky in Hausfather, 1996). Stress brought on by food hardship can harm a person's ability to learn, control their emotions, and develop cognitively. Furthermore, the Cognitive Load Theory contends that too much cognitive load might impede learning and that students' ability to comprehend knowledge is restricted (Sweller, 1988). Cognitive load can be caused by food insecurity which leads to stress and anxiety, making it more difficult for learners to focus and engage in the classroom. The findings of poor engagement in the classroom are also supported by (Ferreira et al., 2024).

This study is grounded in Maslow's Hierarchy of Needs theory (Maslow, 1943), which posits that individual's basic physiological needs must be fulfilled before higher-level cognitive and self-actualization needs can be addressed. By applying Maslow's framework, this research investigates how unmet basic nutrition needs (physiological level) impact learners' capacity for academic achievement (cognitive level). Food insecurity is a critical issue that significantly impacts learner performance in the classroom. The lack of inadequate nutrition impairs cognitive function, emotional well-being, and social development, all of which are essential for academic success. Addressing food insecurity is not only a matter of public health but also an educational imperative. Therefore, the study aims to inform policymakers, education, and other sponsors to advocate for programmes like afterschool feeding initiatives, and food parcels to mitigate the negative impacts of food insecurity, thereby helping learners perform better academically.

RESEARCH METHODOLOGY

The study used a qualitative methodology, and the interpretivism paradigm was applied to describe the goal of the research's conclusions. In order to comprehend the experiences and effects of food insecurity on students' academic performance, a qualitative research style was appropriate for this study. According to interpretivism, statistical models like those employed by positivist paradigms cannot adequately capture the complexity of human conduct. Given that the study seeks to explore the impact of food insecurity on learner performance, the interpretivism paradigm was selected. Interpretivism paradigm focuses on the meanings and experiences of individuals within their specific social contexts, recognizing that reality is constructed through social interactions (Cresswell & Poth, 2018). This interpretivist paradigm was suitable for exploring the complexities and contextual specifics of how food insecurity affects a learner's performance in the classroom.

Research design

Using a case study design, this research was carried out at Tshehlo Secondary School in the Capricorn South District. A case study by Guggenberger et al., (2022) claims thorough examination of a single person, organisation, event, or community. Since the case study approach concentrates on a single school and the researcher in this study concentrated on a single grade and class, it was determined that it was suitable for this investigation. Using a qualitative methodology, the researcher investigated the root causes of food insecurity and the detrimental effects it has on students' academic performance.

Sampling

Purposive sampling was used in this study to choose participants. Purposive sampling is the process of choosing participants based on a variety of novel traits that enable them to provide the data required for the research (Campbell et al., 2020). Purposive sampling, according to Andrade (2021), is the process of choosing a sample based on the researcher's assessment of which participants best meet the study's requirements and chosen with a specific experiment goal in mind. In order to determine whether food insecurity has an impact on low-performing students, the researchers divided the sample size of forty students, twenty top achievers and twenty low performers from Tshehlo Secondary School in the Capricorn South District of the Limpopo Province, South Africa.

Data collection

All participants in this research participated voluntarily and no monetary value was added to influence participants to be part of this research. The data collection process for this study was rooted in qualitative approach, designed to gather in-depth insight into how food insecurity affects learners' academic performance at Tshehlo Secondary School, Capricorn South District. The study used various data generation methods including focus groups, observation, and semi-structure interviews, and survey. The researchers assembled participants to form two exploratory focus groups, each with twenty participants which were a division of twenty top achieving learners and twenty low performing learners to investigate how food insecurity affects their classroom performance. The researchers provided a semi-structured paper survey to all participants printed manually. The responses of the two focus groups were recorded (with consent) and transcribed for further analysis.

Data analysis

The two focus groups, divided into top-performing and low-performing learners, were analysed by the researchers to compare their experiences with food insecurity and how it affects their performance in the classroom. Thematic analysis was applied to the transcriptions to identify recurring themes related to how food insecurity affects classroom performance. Themes such as concentration issues, participation in class, and energy levels were extracted. The high performing learners expressed challenges in maintaining focus during lessons when hungry, but their resilience and coping mechanisms allowed them to perform well academically. In contrast,

the low-performing learners frequently mentioned how hunger led to increased absenteeism, difficulty retaining information, and lack of motivation in the classroom.

The researchers analysed the data generated through the semi-structured paper survey which provided data that supported the qualitative findings from the focus groups. The researchers recorded survey responses which were categorised based on indicators such as frequency of hunger, levels of energy, and self-reported academic struggles. For instance, learners who frequently reported skipping meals showed a significant correlation with lower self-reported grades and overall dissatisfaction with their academic performance. A comparison between the high-performing learners and low-performing revealed that, while both groups experienced food insecurity, the low-performing group reported higher incidences of hunger and greater disruptions to their schoolwork.

The interviews with participants alongside classroom observation by the researchers provided context for the learners' experiences. The researchers noted that learners affected by food insecurity were more likely to exhibit behavioural issues, such as irritability or disengagement, especially in the morning before school lunch meal was served. These observations aligned with learner's reports from the focus groups, where they described feeling tired or distracted when hungry. The interviews confirmed that teachers often struggled to provide individualized support to food-insecure learners, as the scale of the problem was beyond what the school could manage without external support.

Ethical considerations

The quest for information among researchers may lead to the violation of human rights and invasion of the participant's privacy. According to Budin-Ljøsne et al., (2023), the philosophy of ethics emerged as a way of protecting units of analysis and governing professionalism. The concept involves the way in which research subjects should be treated and how harmful activities could be avoided. In this study, the researchers applied to be granted permission to conduct the study from the Research Ethical Community (REC), for project number TREC/999/2024:PG, stakeholder permission from the school principal at Tshehlo Secondary School where the study took place, the participants, and the parents of the participants. In this study, participants were fully informed about the nature, potential risks, purpose, procedures, and the benefits of the study before they agreed to provide consent for their children to participate on the research. The researchers provided a detailed information sheet and consent forms in the appropriate language, which explains the study's aim, procedures, potential risks, and benefits (Creswell & Poth, 2018). According to Al Tajir (2018), the participants must not be forced to participate in research. As a result, the researchers ensured that participation is entirely voluntary and that the participants can withdraw from the study at any given time without any negative consequences. For participants (learners) under the age of eighteen, the researchers obtained written consent from their parents or legal guardians in addition to the learner's assent to participate. Participants were informed that all the information collected will be strictly kept confidential and be utilised for academic purposes only. The researchers ensured

that reports do not include any information that could identify participants involved in the study. The researchers ensured that the process of this study does not cause any physical, emotional, or psychological harm to participants, especially when dealing with a sensitive topic like food insecurity. During this research, the researchers ensured that participants are permitted to withdraw from the study whenever they want to do so. Additionally, participants were also informed that they are free to withhold any information which is sensitive to them. The researchers ensured that all participant's autonomy and dignity were respected throughout the research process. All participants were treated with respect and courtesy, while acknowledging their autonomy and their right to make decisions about their involvement in the study. The researchers showed sensitivity to all the participants` cultural norms and practices, adapting research methods which are necessary to respect their backgrounds as Manti & Licari (2018) argue that such is necessary in research that includes human beings. Ensuring validity and reliability is important in qualitative research to produce credible and trustworthy findings. The methods to improve the study's validity and reliability regarding the effect of food insecurity on students' academic performance in the classroom at Tshehlo Secondary School in the Capricorn South District of the Limpopo Province, South Africa, were described in this part. Cohen et al., (2017) define validity in qualitative research as the reliability and correctness of the results. It consists of various aspects such as credibility, transferability, dependability, and confirmability. In terms of validity, the researchers collected data using focus groups. For valid findings, the researchers then shared preliminary findings with participants to check the accuracy. A study conducted by Sürücü and Maslakci (2020) asserts that this process helps to validate interpretations and ensures that their findings reflect the participants' realities. The researchers spent sufficient time at Tshehlo Secondary School to build trust with participants and gain an in-depth understanding of how food insecurity affects learners` performance in the classroom. This prolonged engagement enhances the accuracy and depth of the data (Sürücü & Maslakci, 2020).

To ensure validity, the researchers collected data through focus groups. To help validate the data and give a more thorough picture of how food insecurity impacts students' performance at Tshehlo Secondary School, focus groups and questionnaires were employed. Following the initial data analysis, participants were asked to examine their results to validate their interpretations. This procedure made sure that the viewpoints of the participants were accurately conveyed and that any misconceptions were cleared up. Additionally, thorough explanations will be given to put the results in context, enabling readers to comprehend the environments and circumstances surrounding the data collection and evaluate the findings' applicability to other contacts.

The consistency and dependability of the research method and results are referred to as reliability in qualitative research. To ensure reliability in this study, each step of the research, including data analysis and data collection were interpreted. According to (Maxwell, 2017), transparency allows researchers to follow the same process and verify the findings. The

researchers further ensured consistency using a well-defined research protocol which outlined the procedures for data collection and analysis, reducing variability in how their research was conducted.

DISCUSSIONS OF THEMES

The main topics that surfaced from the qualitative data produced during the investigation of how food insecurity affects students' academic performance at Tshehlo Secondary School are covered in this section. These themes provide a deeper understanding of the multifaceted ways in which food insecurity effects learners` cognitive abilities, emotional well-being, and overall academic outcomes.

Theme 1

Cognitive impairment due to hunger

One of the most critical themes identified in the study is the cognitive impairment that arises from food insecurity. Hunger and malnutrition are known to affect cognitive functions, such as concentration, memory, and critical thinking, which are essential for effective learning (Wrottesley et al., 2023). In this study, the researchers observed that food insecure learners struggled to stay focused driving lessons, particularly in the mornings before receiving any form of school provided meal. Linus frequently complained of having trouble focussing and remembering things, which resulted in subpar academic performance on assignments and tests. According to Ferreira et al.'s research from 2024, children who experience food insecurity exhibit reduced cognitive function, which lowers their scholastic ability. Some participants shared the following comments to echo the cognitive impairment due to hunger;

"It becomes difficult to concentrate when you have not eaten at all. How do you expect someone to concentrate for 5 hours with empty stomach?"

Another participant:

> *"Breakfast improves concentration and classroom participation. Our school should collaborate with local governments and non-governmental organisations to provide us breakfast before we start our morning classes".*
>
> *"These non-governmental organisations in collaboration with Provincial Government should provide food vouchers or home meal deliveries to families experiencing food scarcity. This initiative will assist leaners who come to the school with empty stomach. They will have breakfast at home before they come to school".*

Theme 2

Physical and emotional exhaustion

One of the major consequences of food insecurity for learners is the physical and emotional exhaustion that significantly affects their classroom performance. Chronic fatigue frequently affects students who do not have regular access to wholesome meals, making it difficult for them to concentrate in class and engage fully in school activities. This exhaustion is linked to malnutrition, as inadequate nutrient intake diminishes physical energy and reduces learners`

capacity for sustained concentration (Omoniyi et al., 2024). As learners` energy levels decline, so does their engagement in the classroom, leading to poor academic outcomes. Furthermore, emotional exhaustion stemming from food insecurity is equally damaging. These emotional burdens compound the physical effects of hunger, creating a cycle of disengagement and performance that is difficult to break without targeted interventions. The following are the participants` remarks regarding physical and emotional exhaustion that affects their classroom performance;

> *"Some of our teachers are also to be blamed when it comes to learners who have physical and emotional exhaustion. They cannot identify learners who lack access to nutritious meals".*
>
> *"They need to be trained in order to be able to recognise signs of hunger-related distress and behavioural issues. Some of us do not participate in class because of hunger which leads to misbehaviour".*

Theme 3

Attendance and absenteeism

Absenteeism is another significant theme that emerged in the study. Learners from food-insecure households were found to have higher absenteeism rates compared to their food secure peers. This is likely due to physical fatigue caused by hunger, as well as related health issues such as weakened immune systems, making learners more susceptible to illness. The connection between food insecurity and absenteeism highlights the cyclical nature of hunger's impact on education, which states that missing school leads to academic underperformance, which in turn can further demotivate learners, perpetuating a cycle of poor attendance and low achievement. When asked about the poor attendance and absenteeism, learners made the following remarks;

> *"Food insecurity is a huge problem. Some of the learners do not attend classes because of physical fatigue caused by hunger. That alone leads to academic underperformance".*
>
> *"I have a friend of mine who has been absent for two weeks because of not having food to eat at his place. How do you advice such a learner to come to school when there is also nothing to eat at school".*
>
> *"I understand that learner`s condition, but he or she should come to school even though we only access food after break time".*

Theme 4

Behavioural problems in classrooms

The theme of behavioural problems in the classroom due to food insecurity was evident in the findings. Learners facing chronic hunger were reported to exhibit irritability, frustration, and emotional distress. The researchers observed an increase in disruptive behaviours such as acting out, restlessness, and disengagement from classroom activities. Ferreira et al., (2024) support these findings, as they found that hunger in children contributes to heightened levels of anxiety, depression, and behavioural problems. Furthermore, some learners described feeling isolated

and ashamed of their food insecurity, which further contributed to their withdrawal from peer interactions and classroom participation.

> *"It is not easy to control your behaviour in the classroom if you are hungry. In fact, you become frustrated".*
>
> *"Learners who are hungry are always restless and depressed. It is very easy for them to misbehave".*
>
> *"I lost my best friends because of food insecurity. Sometimes, I feel like they can see that I did not eat at home".*

Recommendations

- To effectively address the impact of food insecurity on learner performance, expanding and strengthening school programs is crucial. This entails ensuring that all food-insecure learners have access to nutritious meals throughout the day, with the particular emphasis on breakfast. Research has consistently shown that breakfast improves concentration and classroom participation (Appiah, 2024). Collaborations with local governments and non-governmental organisations can provide food vouchers or home meal deliveries to families experiencing food scarcity.
- In addition to the programs, implementing comprehensive support system within schools is vital. This includes training teachers to recognize signs of hunger-related distress and behavioural issues. Creating a safe space where learners can access counselling and emotional support is also essential (Adu, 2022). Incorporating nutrition education into the curriculum can raise awareness among learners about their importance of proper nutrition and its impact on academic performance.
- Advocacy for policy-level changes is equally important. Policymakers must prioritise food security as a key component of educational success. This involves investing in sustainable school nutrition programs and addressing the root cause of poverty that leads to food insecurity. By acknowledging the critical link between food insecurity and academic achievement, policymakers can create an environment that supports learners' overall well-being and academic success (Leshabana, 2022).
- To address the impact of food insecurity on the performance of learners in the classroom, Tshehlo Secondary School can adopt several suggestions to support vulnerable learners. First, by collaborating with local government agencies and NGOs to provide funding and resources to assist learners affected by the impact of food insecurity. Tshehlo Secondary School can also implement counselling and support services aimed at addressing the emotional and psychological impact of food insecurity on the performance of learners in the classroom, by training teachers to identify the signs of hunger-related distress and behavioural issues to allow timely intervention. Additionally, creating a safe space where learners can seek support, without fear of stigma, can foster a positive and inclusive environment that encourages learner's well-being.

Summary of results

The study on the impact of food insecurity on the performance of learners in the classroom at Tshehlo Secondary School how revealed several significant challenges that learners face due to inadequate access to nutritious food. One of the primary findings is that food insecurity severely impairs learner's cognitive functions. Learners reported experiencing difficulties with concentration, memory retention, and overall engagement in classroom activities. These findings are consistent with research by Ferreira et al., (2024), who found that hunger negatively affect cognitive development and academic performance. In this study, the researcher also observed that food insecure learners struggled to keep up with lessons, particularly during periods of prolonged hunger, further highlighting the rule nutrition plays in effective learning. Another major finding is the correlation between food insecurity and increased absenteeism. Learners who regularly experience hunger are more likely to miss school due to physical illness, exhaustion, or lack of motivation. This pattern aligns with the research by Appiah (2024), who established that malnourished learners are more prone to absenteeism, which exacerbates academic disparities. Absenteeism not only interrupts learning but also affects the overall classroom engagement.

The study also uncovered the emotional and behavioural impacts of food insecurity. Learners who struggle with hunger were often reported to exhibit behavioural issues such as irritability, lack of participation, or withdrawals from peer interactions. Appiah (2024) supports these emotional and behavioural consequences, he found that children from food insecure households often experience emotional distress, which leads to increased behavioural disruptions in the classroom. The emotional toll of hunger often results in learners disengaging from their academic work, thus further diminishing their academic outcomes.

Finally, the study emphasised how crucial school meal programs are to reducing the consequences of food poverty. (Adeomi et al., 2022) corroborated this finding, then argued that school feeding programs are essential for improving classroom engagement and academic performance among food-insecure learners. However, the study also found that these programs are sometimes insufficient in fully addressing learners` nutritional needs, indicating the need for expanded access and more comprehensive interventions.

CONCLUSION

To conclude, this establishes that there is a connection between learners' academic performance and food insecurity which they experience from homes. From the findings it becomes clearer that low concentration and attention results, in classrooms as learners fall asleep due to hunger. At the same time, there is even literature which shows that those learners from food secure backgrounds tend to be successful in terms of academic achievements. Since the issue of school performance and pass rate is one of serious expectations in South Africa, this study also levelled some few recommendations emanating from the themes of this study. By the way, those themes formulate the analysis of this study's findings. Although some scholars

might still look at this issue in different perspectives like quantitative approaches to this problem, this study has achieved its objectives as outlined in the introduction.

Limitations of the study

Limitations to this study are of three folds; (a) sample size and generalizability, (b) self-reporting limitation, and (c) short-term limitation. Firstly, study's sample size may limit generalizability to other schools or districts, particularly those in diverse socio-economic settings (Akanle et al., 2020). The study was conducted at Tshehlo Secondary School in the South African province of Limpopo's Capricorn South District. With only a single school or a small number of learners participating, the findings may not accurately represent the experiences of learners in other contexts. To better understand how food insecurity affects students' focus and attention in the classroom, how it affects their academic performance, how it affects their academic achievements, and whether there are any differences in academic success between students from food secure backgrounds and those from food insecure homes, researchers should carry out studies with a larger sample size and in a variety of contexts. This will allow the impact of food insecurity on learners` academic performance to be studied on a more comprehensive comparative basis. Secondly, relying on self-report through interviews or surveys introduces the risks of self-reporting bias, where participants may underreport food insecurity due to social desirability or embarrassment (Bauhoff, 2024). Consequently, this can jeopardise the findings' accuracy. Lastly, this study's short-term duration may only capture the immediate effects of food insecurity on academic performance, neglecting the long-term consequence of chronic food insecurity as Barzuza & Talley (2020) would argue.

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Author`s Contributions

The authors gathered the data, carried out the analysis and interpretation, and participated in the study's design. The authors helped with the article editing and made critical revisions to the study. The final manuscript was read and approved by the authors.

Availability of Data and Materials

Upon reasonable request, the respective authors will provide the datasets used and/or analysed in the current study.

Declaration of Conflicting Interests

Regarding the research, authorship, and/or publication of this paper, the authors disclosed no potential conflicts of interest.

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