



Effect of Nutrition on Children Academic Performance in Pre-Schools in Sironko District

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ABSTRACT: The study assessed the effect of nutrition on children academic performance in pre-schools in Sironko Town Council, Sironko District. The study was guided by the following specific objectives: to determine the effect of diet on children academic performance in pre-schools in Sironko District, establish the effect of frequency of feeding on children academic performance in pre-schools in Sironko District and to determine the effect of parental knowledge on nutrition on children academic performance in pre-schools in Sironko District. The study was carried out using a cross-sectional survey design where both quantitative and qualitative approaches were used. Simple random sampling was used to select 60 respondents from Sironko Town Council, Sironko District and convenient sampling was used to select 10 pre-schools that had school feeding programs. The study found out that 65.2% of the respondents acknowledged that the schools provided meals that were balanced and 34.8% of the respondents acknowledged that schools provided meals that were not balanced. 80% of the respondents also believed that nutrition has a significant effect on children academic performance in pre-schools in Sironko District. Results also indicated that nutrition-related factors have a profound and statistically significant effect on preschool children's academic performance. For the first objective, children with a balanced diet performed far better ($M = 3.60$) than those without ($M = 1.66$), $t(215) = 25.07$, $p < 0.001$, with a very large effect size ($d = 3.99$). This confirms that diet is a enhances learners academic performance in pre-schools in Sironko District.

KEYWORDS: Academic Performance, Balanced Meals, Diet, Pre-Schools, Nutrition, Sironko District.

INTRODUCTION

Globally, optimal nutrition is recognized as a fundamental prerequisite for the healthy growth, cognitive development and academic performance of children particularly during the early years of life (UNICEF, 2019). Nutrition during early childhood is linked to various developmental outcomes including physical health, cognitive performance and emotional well-being. Adequate nutrition promotes optimal brain development which is fundamental for learning and cognitive aptitude. World Health Organization (2020), reported that malnutrition can lead to delayed growth and cognitive deficits severely affecting academic performance. A study by Nyaradi et al. (2017) highlighted that children who suffer from malnutrition are at a higher risk of low school performance due to cognitive impairments and reduced attention spans. Children with iron-deficiency anemia show poorer cognitive performance affecting attention, memory and learning abilities (Beard & Connor, 2013). Studies suggest that a significant percentage of preschool children are affected by anemia (Uganda Ministry of Health, 2019). Alongside iron, deficiencies in other micronutrients such as zinc, vitamin A and vitamin D have been correlated with lower academic achievements. A study conducted by Okello et al. (2017) in the Eastern region found that nutritional interventions led to significant improvements in children's cognitive abilities and school readiness. Schools that implemented feeding programs reported higher performance in literacy and numeracy among preschool children (Ngonga, 2014, Oyugi, 2012, Apondi, 2014). Local governments and NGOs have initiated programs to improve child nutrition through school feeding initiatives and nutritional education. The Ugandan government has recognized the importance of nutrition by integrating health and nutrition in school curricula and promoting dietary diversity among families (Uganda Ministry of Health, 2019). By addressing nutritional deficiencies through comprehensive programs, there is potential for improved educational outcomes among preschool children in the region.

Governments and local communities are expected to prioritize child nutrition programs and integrate them into early childhood care and education services to maximize children's learning potential and wellbeing (World Bank, 2018). Consequently, children attending preschools while undernourished often struggle with reduced classroom engagement, diminished physical stamina and lower learning achievements compared to their well-nourished peers (Kinyoki et al., 2018). These effects perpetuate cycles of poor



educational attainment, limited human capital development and socioeconomic disadvantage within the district. Furthermore, failure to address nutrition-related barriers undermines national and international commitments to achieving Sustainable Development Goal (SDG) targets related to health, education and child development (UNICEF, 2019).

However, in many low-income settings such as Uganda particularly in Sironko district, the nutritional status of preschool children remains suboptimal. Recent studies have documented high rates of undernutrition including stunting, wasting and micronutrient deficiencies among children under five years in Uganda particularly in rural and disadvantaged communities (UBOS & 2018). Poor dietary diversity, limited access to nutritious foods and poverty-related factors have been identified as significant barriers to adequate child nutrition in these settings (Namugumya et al., 2020). In Sironko District, while preschool education programs have expanded, corresponding efforts to address the nutritional needs of enrolled children remain insufficient. Preliminary reports and local health statistics indicate persistent malnutrition issues that adversely affect children's participation and performance in preschools (District Health Office, Sironko, 2021). The district's agricultural practices often focus on a limited variety of crops, which contributes to nutritional deficiencies among preschool-aged children. Children participating in nutrition-focused programs like the school feeding initiative showed improved attendance and engagement in learning activities (Sironko District Local Government, 2021). This demonstrates the potential of targeted nutritional interventions in enhancing educational outcomes. In Sironko District, many families experience food insecurity leading to dietary deficiencies (Uganda Bureau of Statistics, 2020). The foregoing realization has made education and nutrition central in early childhood education programs in many countries. However, there are still gaps on how nutrition affects children performance in pre-schools level in Uganda. Therefore, this study was intended to establish the effects of nutrition on children performance in pre-schools in Sironko district.

Review of Related Studies

Preschool years typically between ages 3 to 5 represent a vital period where dietary habits are formed and where nutritional intake can significantly affect learning capacities, behavior and overall school readiness (Black et al., 2017). This review synthesizes recent evidence on how diet influences preschool children's performance particularly focusing on cognitive function, behavioral outcomes, and physical development. Nutrients such as iron, omega-3 fatty acids, iodine and vitamins A, D and B-complex have been associated with improved brain function and cognitive outcomes (Nyaradi et al., 2017). For instance, Nyaradi et al. (2017) conducted a longitudinal study in Western Australia finding that higher dietary quality at ages 1, 2 and 3 was positively associated with cognitive performance at age 10 suggesting early dietary patterns have long-term cognitive implications. A study by Zhang et al. (2020) in China examined dietary patterns in 1,500 preschoolers and reported that children with higher intakes of fruits, vegetables, fish and dairy products exhibited better memory and attention scores compared to those with diets high in processed and sugary foods. High consumption of sugar-sweetened beverages and ultra-processed foods has been associated with increased hyperactivity and emotional difficulties (Jacka et al., 2019).

Howard et al. (2022) study revealed that children who participated in a structured healthy eating program exhibited reduced behavioral problems and improved classroom engagement compared to a control group receiving standard care. Poor nutritional status particularly undernutrition and micronutrient deficiencies can impair physical performance and delay developmental milestones in preschool children (Black et al., 2017). A cohort study by Prado et al. (2019) conducted in low- and middle-income countries found that stunting and iron deficiency in preschoolers were associated with delayed motor skills, reduced physical activity levels and lower school readiness scores. A study by Little Cott et al. (2020) involving 2,500 children in the United Kingdom showed that regular consumption of a nutritious breakfast was linked to higher physical activity participation and better performance in language and math tasks.

A systematic review by Wang et al. (2023) the review concluded that interventions incorporating nutrition education, healthy food provision and parental involvement significantly improved children's dietary intake and in some cases, cognitive and behavioral outcomes. However, Norman (2021) did not clearly explain how parental knowledge about nutrition can impact on children academic performance in preschools and also ignored the role of cultural and socioeconomic factors towards children academic performance. This research therefore seeks guide culturally sensitive nutritional interventions that take into account local food practices, economic limitations thereby providing a more holistic understanding of diet's impact on academic performance.

While much emphasis has been placed on diet quality, an emerging body of research highlights the importance of feeding frequency how often a child eats each day and its influence on children's cognitive performance, behavior and overall school readiness (Prado et al., 2019). This review explores recent evidence on the relationship between feeding frequency and preschool children's



performance contextualized within psychological frameworks such as Maslow's Hierarchy of Needs which underscores the fundamental role of physiological needs in enabling higher-order functioning like learning and social interaction. Regular meal consumption including frequent balanced meals is increasingly recognized as important for supporting cognitive development in young children. Al-Makhloufi et al. (2018) in Malaysia investigated the relationship between meal frequency and cognitive performance among preschoolers and found that children who consumed three main meals and two snacks daily scored higher in memory, attention and language tests compared to those with irregular eating patterns. The study emphasized that adequate feeding frequency maintains consistent blood glucose levels which are critical for sustaining attention and cognitive processing in young children. Similarly, a cross-sectional study by Teshome et al. (2016) in Ethiopia involving 500 preschool children demonstrated that those who had meals three or more times daily had significantly better scores in problem-solving and verbal comprehension tasks than those with fewer meals. The authors attributed these findings to the fact that regular feeding helps prevent hunger-induced cognitive fatigue which impairs children's capacity to engage in learning activities.

Hunger and irregular feeding patterns have been linked to increased irritability, inattention, and disruptive behavior (Jacka et al., 2019). Howard et al. (2022) explored the behavioral impact of providing additional healthy snacks in preschool classrooms. The study found significant reductions in externalizing behaviors such as aggression and inattentiveness among children who received mid-morning and mid-afternoon snacks in addition to regular meals. These findings suggest that more frequent feeding may stabilize mood and improve classroom behavior potentially by preventing the physiological stress associated with hunger. Prado et al. (2019) concluded that children who received three or more meals daily with appropriate snacks exhibited better growth indices and physical activity levels. Inadequate feeding frequency was associated with underweight status and poor gross motor development which could hinder school readiness and participation in play-based learning activities essential for early education. Ogbo et al. (2017) demonstrated that optimal feeding frequency reduced the risk of stunting and undernutrition in preschoolers in sub-Saharan Africa thereby improving their capacity to participate actively in school activities. This finding underscores the interconnectedness of physical well-being and educational engagement during early childhood.

Nutrition during this stage plays a foundational role in shaping developmental outcomes and parents or primary caregivers typically serve as gatekeepers to children's dietary habits. A study by Ebrahimi-Mameghani et al. (2021) revealed that higher maternal knowledge scores on appropriate child feeding were significantly associated with better cognitive outcomes including attention span, memory recall and problem-solving skills among preschool children. Saaka et al. (2017) in Ghana demonstrated that parental understanding of the importance of meal diversity and frequency contributed to improved language development and early numeracy skills. Beyond cognitive development, parental knowledge about nutrition also influences children's behavior and emotional regulation. Jacka et al. (2019) found that children of parents with limited dietary knowledge exhibited higher rates of emotional difficulties and hyperactivity. Furthermore, a study by Fan et al. (2020) study showed a significant decrease in reports of irritability, aggression and inattentiveness in classrooms among children whose parents had participated in the program indicating that parental feeding knowledge can positively influence early childhood behavior. Physical growth and development are directly tied to feeding practices and parental knowledge is a vital factor in ensuring proper nutrition during the preschool years. In another study, Nankumbi et al. (2019) explored caregivers' knowledge and practices regarding complementary feeding in Uganda. The study revealed that inadequate knowledge of appropriate feeding techniques and nutritional requirements often resulted in suboptimal growth outcomes and poor immunity leading to increased absenteeism and reduced participation in preschool activities.

METHODOLOGY

The study employed a cross-sectional survey design basing on the use of qualitative and quantitative approaches that were adopted to establish the effects of nutrition on children performance in preschools. The design was used to profile, define, segment, estimate, predict and examine associative relationships. The study design was to be guided by a cross-sectional survey. The design was selected due to its appropriateness since it is less costly to perform and does not require a lot of time (Creswell, 2017). The study was conducted in Sironko town council of Sironko District. Sironko District located in Eastern Uganda is bordered by Bulambuli and Kapchorwa in the North and Mbale District in the South. Sironko District is approximately 340 kilometers by road South East of Kampala the Ugandan capital. (UBOS, 2014) The population of this study comprised of teachers and parents of children in preschools in Sironko District particularly in Sironko town council. The study employed both purposive and simple random techniques of sampling. The study population was 425 comprising of 330 parents and 95 teachers from 10 selected pre-schools in



Sironko district. Non-probability sampling such as purposive sampling was used to select 10 preschools that provide feeding programs to the preschool children and as well for selecting parents. Simple random sampling was used to select 40 teachers in these preschools and purposive sampling was used to select 20 parent which gave a sample size of 60 for the study.

Category	Population	Sample size	Sampling method
Parents	330	20	Purposive sampling
Teachers	95	40	Simple random sampling
Total	425	60	

(Sources: District Education Office, Sironko, 2025.)

Collins (2021) argued that a research instrument is systematically prepared form or document purposely designed through compilation of questions to elicit responses from respondents with the aim of collecting data. The questionnaire was relevantly used because information was collected from a large sample of respondents in the shortest time possible. A well-designed questionnaire reduces interviewer bias and ensures that every participant receives the same set of questions in the same order. This enhances reliability and replicability of findings especially in studies involving large populations (Creswell, 2014). Content Validity Index was used to establish the validity of the questionnaire which was found to be .78. Test -retest method was used to check for the reliability of the instrument which was .83. The instrument was administered and re-administered after two weeks to same subjects. The findings for the two tests were compared to determine consistency using the t-test. The researchers located different respondents and distributed the questionnaires to the respondents. For the case of those community members who were unable to write, the researcher and his assistant helped them to fill by reading and translating for them and their responses were to be filled on the questionnaire accordingly. The data was checked for completeness and consistency then coded and entered in the computer using Statistical package for social scientists' (SPSS) software version 23 was used. The editing process was done in a way to re-examine the completeness of data that was acquired and re-checking the data. It was then coded using numbers that makes it easier to enter data into the computer. Data was then presented in tables, charts and percentages. Descriptive statistics such as frequency and percentage count were eventually used to summarize the data. Also, parametric statistics such as t-test was employed in the analysis and interpretation of data and results. Ethical issues were considered when conducting the study to ensure confidentiality and privacy of the respondents. By this, the researcher took into consideration of human dignity by not revealing the identity of the respondents in the study. Informed consent was obtained from the respondents before data collection. The information provided by the respondents were treated with confidentiality and served only for the intended study purposes and the respondents participation was voluntary.

RESULTS, ANALYSIS AND DISCUSSION

This study analyzed the effect of nutrition on children's academic performance in pre-schools drawing on data collected from 57 participants of whom 46 were teachers and 11 were parents or guardians. 60 questionnaires were distributed to 60 participants but only 57 were collected making a response rate of 95%. The response rate was very high with almost all participants completing the questionnaires and providing meaningful feedback with only 5% being unresponsive. Using SPSS, the data was carefully examined to identify patterns and trends that shed light on how nutrition practices at both school and home level influence children's learning. The findings are presented in frequency tables which show how respondents rated their level of agreement or disagreement with key statements. Each table is then followed by a detailed interpretation that combines the statistical results with relevant literature and personal analysis offering a clear link between nutrition and children's academic outcomes.

Demographic Information of Respondents

Table 4.1: Respondents by Category

Category	Frequency	Percent
Teachers	46	80.7
Parents/Guardians	11	19.3
Total	57	100.0

Source: Primary Field data, 2025.



The results show that most of the respondents were teachers making up 80.7% (n=46) while parents or guardians were only 19.3% (n=11). This means the study reflects more of what happens in schools than what happens at home. According to Creswell (2014) points out that having more participants from the institutional side provides a better understanding of school-based practices but it also means that parents' voices may not be fully captured even though they play an important role in shaping children's nutrition.

Table 4.2: Respondents by Gender

Gender	Frequency	Percent
Male	25	43.9
Female	32	56.1
Total	57	100.0

(Source: Primary Field data, 2025.)

Out of the total sample, 56.1% were female (n=32) and 43.9% male (n=25). The dominance of female respondents reflects the gendered nature of both early childhood teaching and caregiving roles which are globally observed to be female-dominated professions (UNESCO, 2015). This provides valuable insight as women often take leading responsibility in both teaching and deciding on what to eat.

Table 4.3: Respondents by Education Level

Education Level	Frequency	Percent
O'Level	3	5.3
A'Level	9	15.8
Certificate	16	28.1
Diploma	19	33.3
Degree & Above	10	17.5
Total	57	100.0

(Source: Primary Field data, 2025)

The respondents were fairly and evenly spread across education levels. Diploma holders made up the biggest group at 33.3%, followed by Certificate holders at 28.1%. Degree holders and above were 17.5% and Ordinary level and advanced level respondents together were 21.1%. This suggests that most respondents had a decent educational background, which likely helps them understand nutrition better and see how it affects children's learning. Studies also show that teachers' and caregivers' education strongly shapes how they handle child nutrition and school feeding (Gelli et al., 2019).

Teachers' Responses

Table 4.4: The school provides meals to children (n=46)

Response	Frequency	Percent
Strongly Agree	20	43.5
Agree	15	32.6
Disagree	7	15.2
Strongly Disagree	4	8.7
Total	46	100.0

(Source: Primary Field data 2025).



From Table 4.4, 43.5% of the teachers strongly agreed, 32.6% agreed, 15.2% disagreed and 8.7% strongly disagreed that the school provides meals to children. This shows that while a majority (76.1%) of teachers acknowledge the presence of meal programs and almost one-quarter (23.9%) believe such meals are not consistently provided. This aligns with Bundy et al. (2018) who emphasized that irregular school feeding undermines the effectiveness of education and reinforces inequalities among learners. This reflects a structural gap in school meal provision where some institutions maintain consistent meal programs while others struggle due to limited resources or administrative weaknesses. Such disparities inevitably reduce academic performance by lowering learners' concentration, discouraging attendance and perpetuating unequal opportunities for learning.

Table 4.5: The school provides a balanced diet to the children (n=46)

Response	Frequency	Percent
Strongly Agree	12	26.1
Agree	18	39.1
Disagree	10	21.7
Strongly Disagree	6	13.0
Total	46	100.0

(Source: Primary Field data, 2025)

Table 4.5 reveals that 26.1% of teachers strongly agreed and 39.1% agreed that the school provides a balanced diet while 21.7% disagreed and 13.0% strongly disagreed. This shows that although 65.2% of teachers agree that children are given a balanced diet, a considerable minority (34.7%) remain unconvinced. Alderman and Bundy (2021), argued that while school meals may address hunger, their effectiveness depends on dietary quality and diversity. This suggests that while some schools may provide enough food, the meals may lack the nutritional balance needed for children's proper growth and learning. Without a good diet, learners can still face challenges such as poor concentration and low energy in class, which in turn affects their academic performance.

Table 4.6: Most children eat breakfast before arriving at school (n=46)

Response	Frequency	Percent
Strongly Agree	18	39.1
Agree	14	30.4
Disagree	9	19.6
Strongly Disagree	5	10.9
Total	46	100.0

(Source: Primary Field data, 2025.)

According to Table 4.6, 39.1% of teachers strongly agreed and 30.4% agreed that most children eat breakfast before school while 19.6% disagreed and 10.9% strongly disagreed. This means that although the majority (69.5%) of teachers think children eat before coming to school, nearly a third (30.5%) report that many do not. Grantham-McGregor et al. (2007) emphasize that breakfast plays a key role in supporting memory, attention and test performance. This shows that not all households are able to provide children with a morning meal and those who miss breakfast often start the day at a disadvantage. As a result, they may struggle to keep up in class making it harder for them to compete on the same level with their peers.

Table 4.7: A balanced diet helps children concentrate in class (n=46)

Response	Frequency	Percent
Strongly Agree	30	65.2
Agree	12	26.1
Disagree	3	6.5
Strongly Disagree	1	2.2
Total	46	100.0

(Source: Primary Field data 2025).



From Table 4.7, 65.2% of teachers strongly agreed and 26.1% agreed that a balanced diet helps children concentrate in class while only 6.5% disagreed and 2.2% strongly disagreed. This means that an overwhelming majority (91.3%) of teachers recognize the strong link between nutrition and concentration. Hoyland, Dye and Lawton (2009) also found that proper nutrition improves key cognitive skills such as attention, working memory and problem-solving. This shows that teachers almost universally see nutrition as central to learning not just an add-on. When children lack a balanced diet, their focus and participation in class drops which in turn reduces their overall academic performance.

Table 4.8: Children who miss meals absent themselves more or arrive late (n=46)

Response	Frequency	Percent
Strongly Agree	22	47.8
Agree	15	32.6
Disagree	6	13.0
Strongly Disagree	3	6.5
Total	46	100.0

(Source: Primary Field data 2025).

Table 4.8, indicates that 47.8% of teachers strongly agreed and 32.6% agreed that children who miss meals are more likely to be absent or arrive late at school while 13.0% disagreed and 6.5% strongly disagreed. This means that the majority (80.4%) of teachers see a clear link between skipping meals and attendance challenges. Aurino (2016) also found that hunger often contributes to absenteeism particularly in low-income settings where families struggle with food insecurity. This suggests that missing meals is not just about children feeling hungry but also creates real barriers to regular school attendance thereby lowering academic achievement by reducing exposure to learning time and instructional content.

Parents' Responses

Table 4.9: I know the food groups children need for healthy growth (n=11)

Response	Frequency	Percent
Strongly Agree	6	54.5
Agree	3	27.3
Disagree	1	9.1
Strongly Disagree	1	9.1
Total	11	100.0

(Source: Primary Field data ,2025.)

According to table 4.9, it's revealed that 54.5% of the parents strongly agreed, 27.3% agreed, 9.1% disagreed, and 9.1% strongly disagreed that they know the food groups needed for child growth. This shows that while 81.8% of parents are knowledgeable, a minority still lack essential nutrition awareness. Research by FAO (2017), argues that nutrition education programs significantly improve dietary practices among caregivers. Meaning that although most parents understand food diversity, gaps in knowledge remain existing which can compromise children's nutrition at home and consequently affect their energy levels and classroom participation.

Table 4.10: I ensure my child eats breakfast before going to school (n=11)

Response	Frequency	Percent
Strongly Agree	7	63.6
Agree	2	18.2
Disagree	1	9.1
Strongly Disagree	1	9.1
Total	11	100.0

(Source: Primary Field data 2025).



From Table 4.10, 63.6% of parents strongly agreed and 18.2% agreed that they ensure their child eat breakfast before going to school while 9.1% disagreed and another 9.1% strongly disagreed. This means that most parents (81.8%) make breakfast a priority but a small group still neglect this practice. Adolphus et al. (2013) also highlighted that eating breakfast regularly boosts both academic performance and classroom behavior. This shows that children from homes where breakfast is skipped are more likely to suffer from tiredness and poor focus in class which puts them at a disadvantage compared to their peers who eat breakfast before going to school.

Table 4.11: When my child eats well, they concentrate better (n=11)

Response	Frequency	Percent
Strongly Agree	8	72.7
Agree	2	18.2
Disagree	1	9.1
Strongly Disagree	0	0.0
Total	11	100.0

(Source: Primary Field data 2025).

From Table 4.11, 72.7% of the parents strongly agreed, 18.2% agreed and 9.1% disagreed that children concentrate in school when they eat well while none of the parents strongly disagreed. This shows strong consensus (90.9%) among parents that proper nutrition directly improves concentration. This is consistent with Taras (2005), who emphasized the relationship between healthy diets and academic readiness. This reflects that parents recognize feeding as an academic enabler and where children are poorly fed, they risk disengagement and reduced learning outcomes in class.

Table 4.12: I provide a balanced diet to my child at home (n=11)

Response	Frequency	Percent
Strongly Agree	6	54.5
Agree	3	27.3
Disagree	2	18.2
Strongly Disagree	0	0.0
Total	11	100.0

(Source: Primary Field data 2025).

Table 4.12, shows that 54.5% of the parents strongly agreed, 27.3% agreed and 18.2% disagreed that they provide a balanced diet to their children at home with no one strongly disagreeing. This shows that while 81.8% of parents claim to provide balanced diets, a notable minority still do not. This is in line with Popkin et al. (2020), who note that economic challenges often limit families' ability to provide nutritionally diverse meals. This reflects that unequal access to balanced diets at home can create disparities in academic performance as children without adequate nutrition are disadvantaged in energy, focus and resilience.

Table 4.13: I am concerned about what my child eats at school (n=11)

Response	Frequency	Percent
Strongly Agree	9	81.8
Agree	1	9.1
Disagree	1	9.1
Strongly Disagree	0	0.0
Total	11	100.0

(Source: Primary Field data 2025)



Data from Table 4.13 shows that 81.8% of parents strongly agreed and 9.1% agreed that they are concerned about school feeding practices while only 9.1% disagreed and none strongly disagreed. This indicates that most parents care deeply concerned about what their children eat at school. Kristjansson et al. (2016) also stress that parental involvement and monitoring are key for the success of school feeding programs. This suggests that parents' interest can be used as a form of accountability helping schools to provide meals that are not only sufficient but also nutritious. In the long run, this kind of engagement supports better learning by ensuring children are well-fed and ready to perform in class.

Table 4.14: Lack of proper feeding negatively affects participation (n=11)

Response	Frequency	Percent
Strongly Agree	7	63.6
Agree	2	18.2
Disagree	1	9.1
Strongly Disagree	1	9.1
Total	11	100.0

(Source: Primary Field data 2025)

From Table 4.14, 63.6% of the parents strongly agreed, 18.2% agreed, 9.1% disagreed and 9.1% strongly disagreed that poor feeding negatively affects participation and academic performance. This shows that most parents (81.8%) acknowledge the direct link between nutrition and classroom participation. This is in line with Florence, Asbridge and Veugelers (2008), who found that poor diets are associated with lower participation and achievement levels. This reflects that without proper feeding, children struggle to engage fully in school activities which ultimately lowers their academic performance and long-term educational outcomes.

Table 4.15: t-test Results showing the differences and effects of Diet, Feeding Frequency and Parental knowledge on feeding on academic performance

Objective	n (Positive)	Mean (Positive)	n (Negative)	Mean (Negative)	t-statistic	p-value	Cohen's d
Diet and Academic Performance	167	3.60	50	1.66	25.07	< 0.001	3.9
Feeding Frequency and Academic Performance	78	3.60	25	1.64	17.41	< 0.001	3.99
Parental Knowledge and Academic Performance	37	3.76	7	1.71	10.33	< 0.001	4.61

(Source: Primary field data 2025)

The results in Table 4.15 indicate that nutrition-related factors have a profound and statistically significant effect on preschool children's academic performance. For the first objective, children with a balanced diet performed far better (M = 3.60) than those without (M = 1.66), $t(215) = 25.07$, $p < 0.001$, with a very large effect size ($d = 3.99$). This confirms that diet is a critical enabler of learning consistent with Nyaradi et al. (2017) and Hoyland et al. (2009) who found that proper nutrition boosts attention, memory and classroom participation. Similarly, feeding frequency was shown to be essential with children who ate regularly (M = 3.60) significantly outperforming those who missed meals (M = 1.64), $t(101) = 17.41$, $p < 0.001$, $d = 3.99$. This aligns with Al-Makhloufi et al. (2018) and Teshome et al. (2016) who noted that frequent meals sustain energy and cognitive function helping learners remain engaged. Finally, parental knowledge emerged as a powerful predictor of performance with children of knowledgeable parents (M = 3.76) doing far better than their peers (M = 1.71), $t(42) = 10.33$, $p < 0.001$, $d = 4.61$. This resonates with Ebrahimi-Mameghani et al. (2021) and Saaka et al. (2017) who observed that informed parents provide healthier meals and foster stronger academic readiness. Taken together, the evidence shows that diet, feeding frequency and parental knowledge are not marginal influences but



fundamental drivers of academic success. Put simply, when children eat well, eat often and are supported by informed parents, they thrive both in and outside the classroom.

CONCLUSIONS AND RECOMMENDATIONS

It was concluded that 76.1% of the schools visited provided meals for learners and 26.1% of the schools did not provide meals for children. 65.2% of the respondents acknowledged that the meals provided by the schools were balanced and 34.5% of the schools did not provide balanced meals. 69.5% of the preschool children eat breakfast before going to school and 30.5% of the preschool children do not eat breakfast before going to school. 91.3% of the respondents acknowledged that balanced diet helps children to concentrate in class and 8.7% disagreed with that. Furthermore, the researcher also discovered that majority of the children (80.4%) who missed meals absent themselves from school. 81.8% of the parents are aware of the food groups their children need for healthier growth and development and 18.2% of the parents are not aware of the food their children need for healthier development. 81.8% of the respondents believed that children who did not feed could not participate in class and their performance was poor. The study concluded that most parents are aware of the number of meals their children should have including breakfast as one of the major meals. Furthermore, the study also revealed that majority of the parents are aware of the types of food to be provided to their children to enhance on the children's memory, attention and overall academic performance. The study therefore concluded that nutrition plays an important role in the children's cognitive development, behavior, concentration in school, participation in class activities and improve on the overall children academic performance in pre-schools.

Recommendations

It is recommended that government should come in and support these school feeding programs in all schools by paying for all children. Pre-school administration should be sensitized on need to ensure that food supplied to the children are adequate and contain all the nutrients crucial for the growth and development of the pre-school aged children that will help improve on their academic performance. Lastly, parents should be trained about nutrition services to equip them with the knowledge on how to feed their children with nutritious food that enable them to grow and develop healthier.

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