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Parents' perception of the relationship among dietary diversity, attention span, and learning readiness in preschool children in FCT, Abuja, Nigeria

Uduak M. Offiong
Department of Paediatrics, University of Abuja Teaching Hospital, Abuja Nigeria.
uduak.offiong@uniabuja.edu.ng

Onyeayana Kenneth Nteh
Department of Educational Foundations, Faculty of Education, University of Abuja, Abuja, Nigeria
kenneth.nteh@uniabuja.edu.ng

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Abstracts: *This study investigated parents' perception of the relationship among dietary diversity, attention span, and learning readiness among preschool children in the Federal Capital Territory (FCT), Abuja, Nigeria. The study employed a correlational survey design to examine the relationships among the variables. The target population consisted of parents of preschool children aged 3–5 years enrolled in private nursery schools in the FCT. Using stratified random sampling, a sample of 200 parents was selected from six nursery schools across three municipal districts. Data were collected using a researcher-developed instrument titled Parent Questionnaire on Dietary Diversity, Attention Span, and Learning Readiness. The instrument was validated by experts in Measurement and Evaluation, and data were analysed using mean, standard deviation, and Pearson Product-Moment Correlation (PPMC) at the 0.05 level of significance. The findings revealed that preschool children in the study area experience moderate dietary diversity (Sectional Mean = 3.12), although daily consumption of fruits and vegetables was relatively low. The results also showed that children demonstrate a high level of attention span (Sectional Mean=3.50) and a high level of learning readiness (Sectional Mean = 3.58). Correlation analysis indicated a moderate positive and significant relationship between dietary diversity and attention span ($r=0.472$, $p<0.05$) and a strong positive and significant relationship between attention span and learning readiness ($r=0.655$, $p<0.05$). These results suggest that children who consume a more diverse range of foods tend to demonstrate improved attentional abilities and greater readiness for learning. The study concludes that dietary diversity plays an important role in supporting cognitive functioning and school readiness among preschool children. The study therefore recommends increased parental awareness of balanced nutrition.*

Keywords: dietary diversity, attention; memory, executive function, learning readiness, preschool, Nigeria, Abuja, early childhood development

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INTRODUCTION

Early childhood represents one of the most critical periods of human development, characterised by accelerated brain maturation, heightened neural plasticity, and rapid acquisition of foundational cognitive and socio-emotional skills. During these formative years, children are susceptible to environmental influences, including family practices, caregiving quality, and particularly nutritional intake, which collectively shape their emerging cognitive abilities, attention regulation, memory processes, and early learning behaviours. Adequate nutrition is widely recognised as a prerequisite for optimal brain development, while deficiencies during this period may have long-lasting consequences on intellectual functioning and academic readiness. School readiness, conceptualised as a child's holistic preparedness to participate in, adapt to, and benefit from structured learning experiences, is therefore influenced not only by early academic stimulation but also by a child's health, nutritional status, and psychosocial environment (UNICEF, 2021).

In the Federal Capital Territory (FCT), Abuja, increasing efforts have been made to expand access to early childhood education through both public and private preschool centres. Despite these advancements, significant disparities exist in household socioeconomic status, parental education, and food security, which contribute to unequal access to nutritious diets among preschool-aged children. Such disparities raise important concerns about potential differences in cognitive readiness, sustained attention, working memory, and general school engagement among children entering formal education settings.

Existing empirical evidence highlights that dietary diversity, the variety of food groups consumed over a given period, serves as a reliable indicator of nutrient adequacy and is closely linked to children's physical growth, immune function, and cognitive development (FAO, 2020). A diverse diet ensures adequate intake of essential micronutrients such as iron, iodine, zinc, and omega-3 fatty acids, all of which are vital for neurocognitive processes, including attention, executive functioning, and memory consolidation. However, despite the global recognition of these connections, there remains a noticeable gap in the Nigerian context regarding how dietary diversity specifically influences early cognitive processes that underpin learning readiness. Few studies have examined the pathways through which nutrition interacts with psychological variables, particularly attention span, working memory capacity, and early learning behaviours, in preschool populations.

This study seeks to address this research gap by investigating the interplay between dietary diversity, attention span, memory development, and learning readiness among preschool-aged children in the FCT. By examining these interrelated variables, the study aims to contribute valuable insights into how nutrition shapes early cognitive functioning and preparedness for formal schooling. The findings will not only enrich the existing body of knowledge but will also inform policymakers, educators, and caregivers on targeted strategies to improve early childhood development outcomes through nutritional interventions in the region.

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LITERATURE REVIEW

Dietary Diversity and Cognitive Development

Dietary diversity is widely recognised in nutritional science and public health as a robust proxy indicator for assessing the adequacy of micronutrient intake, particularly in children (Ruel, 2003; Kennedy, Ballard, & Dop, 2011). This concept refers to the number of different food groups or items consumed over a reference period, typically 24 hours, and captures a broader picture of diet quality than caloric intake alone. In settings with limited food availability or in populations experiencing poverty, dietary diversity serves as an efficient and practical indicator of nutritional sufficiency (FAO, 2014).

Among young children, especially those in their early developmental years (ages 1–5), achieving a diverse diet is strongly associated with better physical growth outcomes, enhanced immunity, and, more recently, improved cognitive development (Ruel et al., 2018). A diverse diet typically includes food groups such as whole grains, legumes, dairy, fruits, leafy vegetables, animal protein (meat, eggs, fish), and fortified cereals or oils.

Children who consume a sufficiently diverse range of foods are significantly more likely to meet their daily micronutrient requirements, which are essential for optimal neurological development (Gewa & Fernald, 2020). These micronutrients include iron, which supports oxygen transport and is critical for attention and memory functioning; zinc, necessary for neurotransmitter activity and synaptic plasticity; iodine, essential for thyroid hormone synthesis and cognitive development; and vitamin A, which supports visual health and immunological integrity (Black et al., 2013).

Additionally, long-chain polyunsaturated fatty acids, especially docosahexaenoic acid (DHA), found in fish and breast milk, are critical for the development of the brain's structural components and support myelin formation, synaptic connectivity, and executive functioning, including working memory and learning capacity (Innis, 2007; Lauritzen et al., 2016). These nutrients work synergistically to support neural proliferation, neurotransmitter function, and cognitive regulation, which are vital for attention span, language development, sensory integration, and emotional control in early childhood (Grantham-McGregor et al., 2018).

Furthermore, studies in low- and middle-income countries, including Nigeria, have confirmed that children from households with greater dietary diversity tend to have better scores on early childhood development assessments (Adewuni & Okoh, 2021; Osei et al., 2010). Conversely, children with poor dietary diversity are more likely to exhibit developmental delays, attention deficits, and learning readiness challenges, likely due to suboptimal micronutrient intake during brain-sensitive periods of growth (Walker et al., 2007).

Given the critical window of brain development in the first five years of life, which sets the foundation for later academic attainment and lifelong learning, ensuring adequate dietary diversity

is not only a nutrition issue but also an important strategy for improving school readiness and educational equity, particularly in underserved populations like those in parts of the Federal Capital Territory (FCT), Abuja.

Attention Span and Early Learning

Attention is the cognitive process by which a child focuses on specific stimuli while ignoring distractions. A longer attention span in early childhood is predictive of later academic achievement and executive functioning (Posner & Rothbart, 2017). Malnutrition or deficiencies in key nutrients have been linked to attention deficits, which may impair classroom engagement and increase impulsive behaviour (Best et al., 2022).

Learning Readiness and School Success

Learning readiness encompasses a range of skills, including language development, early numeracy, social-emotional development, and cognitive skills such as memory and attention. The effectiveness of early childhood education programs is heavily dependent on children's readiness to learn and engage (Britto et al., 2017). Since these functions are biologically and environmentally influenced, it is essential to understand the nutritional antecedents of learning readiness, particularly in contexts like Nigeria, where food insecurity and malnutrition remain concerns (NNHS, 2018).

The following research questions were answered in this study.

1. What is the level of dietary diversity among preschool children in FCT, Abuja?
2. What are the average attention span scores of preschool children in FCT, Abuja?
3. What is the level of learning readiness among preschool children in FCT, Abuja?

$H_0$1: There is no significant relationship between dietary diversity and attention span in preschool children in FCT, Abuja.
$H_0$2: There is no significant relationship between dietary diversity and learning readiness in preschool children in FCT, Abuja.
$H_0$3: There is no significant relationship between attention span and learning readiness in preschool children in FCT, Abuja.

METHODOLOGY

This study employed a correlational survey design to investigate the nature and strength of the relationships between dietary diversity, attention span, memory, and learning readiness in preschool children.

The target population consisted of parents of preschool children aged 3–5 years who enrolled in private nursery schools in FCT, Abuja. Using stratified random sampling, 200 parents were selected from six schools across three municipal districts. Stratification was based on the type of school geographic zone (urban vs peri-urban).

The instrument for data collection was a researcher-developed questionnaire titled "*Parent Questionnaire on Dietary Diversity, Attention Span, and Learning Readiness*". The questionnaire was validated by experts in measurement and evaluation in the Faculty of Education, University of Abuja.

RESULTS

Research Question One: What is the level of dietary diversity among preschool children in FCT, Abuja?

Table 1: The level of dietary diversity among preschool children in FCT, Abuja

N=200

S/N	Items	Mean	Std Dev	Decision
1	My child regularly eats grains, roots, or tubers such as rice, yam, or bread.	3.46	.933	Agreed
2	My child consumes beans, nuts, or legumes at least several times a week.	2.83	1.167	Agreed
3	My child frequently consumes dairy products such as milk or yoghurt.	3.32	.997	Agreed
4	My child often eats meat, fish, poultry, or eggs.	3.53	.868	Agreed
5	My child eats a variety of fruits and vegetables every day.	2.49	.977	Disagreed
	Sectional Mean	**3.12**	**0.988**	

Table 1 presents the responses of caregivers on the dietary diversity of preschool children in the Federal Capital Territory (FCT), Abuja. The analysis is based on the mean and standard deviation of responses to five dietary indicators. The results show that four out of the five items recorded mean scores above the criterion mean of 2.50, indicating general agreement among respondents that preschool children consume several categories of food regularly. Specifically, respondents agreed that their children regularly eat grains, roots, or tubers such as rice, yams, or bread (M=3.46, SD=0.933). This suggests that staple carbohydrate foods form a significant part of the children's daily diets.

Similarly, caregivers agreed that their children consume beans, nuts, or legumes several times a week (M=2.83, SD=1.167), indicating moderate intake of plant-based protein sources. The table also reveals agreement that preschool children frequently consume dairy products such as milk or yoghurt (M=3.32, SD=0.997), suggesting reasonable access to calcium-rich foods necessary for growth and development.

Furthermore, respondents agreed that their children often eat meat, fish, poultry, or eggs (M=3.53, SD=0.868). This item recorded the highest mean score, implying that animal protein sources are relatively common in the diets of preschool children in the study area.

However, respondents disagreed with the statement that their children eat a variety of fruits and vegetables every day (M=2.49, SD=0.977). This indicates insufficient daily consumption of fruits and vegetables, which are important sources of vitamins, minerals, and dietary fibre necessary for proper growth and immune function. The sectional mean of 3.12 with a standard deviation of 0.988 indicates that, overall, dietary diversity among preschool children in FCT, Abuja, is relatively moderate to high.

Research Question Two: What are the average attention span scores of preschool children in FCT, Abuja?

Table 2: The average attention span scores of preschool children in FCT, Abuja
N=200

S/N	Items	Mean	Std Dev	Decision
6	My child can stay focused on a task for age-appropriate periods.	2.88	.846	Agreed
7	My child is not easily distracted during play or learning activities.	2.73	.901	Agreed
8	My child follows simple multi-step instructions.	3.33	.751	Agreed
9	My child can stay focused on tasks.	3.02	.847	Agreed
10	My child can sit still and listen during short lessons.	3.30	.722	Agreed
	Sectional Mean	**3.50**	**0.813**	

Table 2 presents the responses of caregivers regarding the attention span of preschool children in the Federal Capital Territory (FCT), Abuja. The analysis is based on the mean and standard deviation of responses to five indicators that describe children's ability to concentrate during learning and play activities.

The results indicate that all the items recorded mean scores above the criterion mean of 2.50, which implies that respondents generally agreed that preschool children demonstrate a reasonable level of attention span.

Specifically, respondents agreed that their children can stay focused on a task for age-appropriate periods (M=2.88, SD = 0.846). This suggests that many preschool children possess the expected level of concentration for their developmental stage. Similarly, caregivers agreed that their children are not easily distracted during play or learning activities (M=2.73, SD=0.901), although this item recorded the lowest mean score, indicating that distraction may still occur occasionally among some children.

Furthermore, respondents agreed that their children can follow simple multi-step instructions (M=3.33, SD=0.751). This relatively high mean score indicates good levels of cognitive engagement and listening ability among preschool children. In addition, caregivers reported that their children can stay focused on tasks (M = 3.02, SD = 0.847), reinforcing the notion that many children in the study demonstrate adequate task persistence.

The findings also show agreement that children can sit still and listen during short lessons (M=3.30, SD = 0.722). This suggests that the children are capable of maintaining attention in structured learning environments, such as classroom activities. The sectional mean of 3.50 with a standard deviation of 0.813 indicates that preschool children in FCT, Abuja, generally exhibit a relatively high level of attention span across the assessed behaviour. The relatively low standard deviations across the items further suggest that responses among caregivers were fairly consistent.

The findings imply that most preschool children in the study area demonstrate adequate attentional abilities, including the capacity to focus on tasks, follow instructions, and remain attentive during short learning sessions.

Research Question Three: What is the level of learning readiness among preschool children in FCT, Abuja?

Table 3: The level of learning readiness among preschool children in FCT, Abuja
N=200

S/N	Items	Mean	Std Dev	Decision
11	My child recognises letters, numbers, or basic shapes.	3.56	.837	Agreed
12	My child can follow classroom rules with guidance.	3.64	.658	Agreed
13	My child plays cooperatively with peers.	3.62	.733	Agreed
14	My child shows interest in learning new things.	3.52	.672	Agreed
15	My child can complete simple learning tasks independently.	3.60	.626	Agreed
	Sectional Mean	**3.58**	**0.705**	

Table 3 presents caregivers' responses regarding the learning readiness of preschool children in the Federal Capital Territory (FCT), Abuja. The analysis examines five indicators related to early cognitive, social, and behavioural skills necessary for successful participation in formal learning environments. The results indicate that all the items recorded mean scores above the criterion mean of 2.50, showing that respondents generally agreed that preschool children demonstrate a high level of learning readiness.

Specifically, respondents agreed that their children recognise letters, numbers, or basic shapes (M = 3.56, SD = 0.837). This finding suggests that many preschool children possess foundational

cognitive skills required for early literacy and numeracy development. Similarly, caregivers agreed that their children can follow classroom rules with guidance (M = 3.64, SD = 0.658). This item recorded the highest mean score, indicating that most children are capable of adapting to classroom expectations when guided by teachers or caregivers.

The results also show agreement that children play cooperatively with peers (M=3.62, SD =0.733). This suggests that preschool children in the study area demonstrate adequate social interaction skills, which are important for collaborative learning and classroom harmony.

Furthermore, respondents agreed that their children show interest in learning new things (M=3.52, SD=0.672). This indicates a positive learning disposition and curiosity, both of which are essential components of effective early childhood education. Caregivers also agreed that their children can complete simple learning tasks independently (M=3.60, SD=0.626), reflecting the development of basic problem-solving and self-directed learning abilities.

The sectional mean of 3.58 with a standard deviation of 0.705 indicates that preschool children in FCT, Abuja, generally exhibit a high level of learning readiness across the assessed indicators.

$H_0$1: There is no significant relationship between dietary diversity and attention span in preschool children in FCT, Abuja.

Table 4: Test of Relationship between dietary diversity and attention span in preschool children in FCT, Abuja

Variables	N	Mean	*r*-cal	P-value	Decision
Dietary diversity and Attention span	200	3.12 3.50	.472	.000	Rejected

Table 4 presents the results of the Pearson Product-Moment Correlation analysis conducted to determine the relationship between dietary diversity and attention span among preschool children in the Federal Capital Territory (FCT), Abuja. The findings show that the mean score for dietary diversity is 3.12, while the mean score for attention span is 3.50. These mean values indicate that preschool children in the study area generally experience moderate to high dietary diversity and relatively high attention span.

The correlation analysis produced a correlation coefficient (r) of 0.472, which indicates a moderate positive relationship between dietary diversity and attention span among preschool children. This implies that as the diversity of children's diets increases, their attention span tends to improve. In other words, children who consume a wider variety of foods are more likely to demonstrate better concentration and focus during tasks, play, or learning activities.

Furthermore, the p-value of 0.000 is less than the 0.05 level of significance ($p < 0.05$). This indicates that the relationship between dietary diversity and attention span is statistically significant. As a result, the null hypothesis stating that there is no significant relationship between dietary diversity and attention span among preschool children in FCT, Abuja, is rejected.

The finding suggests that dietary diversity plays an important role in supporting children's cognitive functioning, particularly their ability to sustain attention during activities. Adequate intake of various food groups provides essential nutrients such as vitamins, minerals, and proteins that contribute to brain development, neurological functioning, and cognitive performance in early childhood. The results indicate that a significant and positive relationship exists between dietary diversity and attention span among preschool children in FCT, Abuja. This underscores the importance of providing nutritionally diverse diets for preschool children to enhance their cognitive development and learning capacity.

$H_0$2: There is no significant relationship between dietary diversity and learning readiness in preschool children in FCT, Abuja.

Table 5: Test of Relationship between dietary diversity and learning readiness in preschool children in FCT, Abuja

Variables	N	Mean	*r*-cal	P-value	Decision
Dietary diversity and	200	3.12 3.58	.655	.000	Rejected
Learning readiness					

Table 5 presents the results of the Pearson Product-Moment Correlation analysis conducted to determine the relationship between dietary diversity and learning readiness among preschool children in the Federal Capital Territory (FCT), Abuja. The results indicate that the mean score for dietary diversity is 3.12, while the mean score for learning readiness is 3.50. These mean values suggest that preschool children in the study area generally experience moderate dietary diversity and a relatively high level of learning readiness.

The correlation analysis yielded a correlation coefficient (r) of 0.655, which indicates a strong positive relationship between dietary diversity and learning readiness. This implies that as the level of dietary diversity increases, the level of learning readiness among preschool children also tends to increase. In other words, children who consume a wider range of food groups are more likely to demonstrate better preparedness for learning activities, including recognising letters and numbers, following classroom rules, cooperating with peers, and completing simple learning tasks.

Furthermore, the p-value of 0.000 is less than the 0.05 level of significance ($p < 0.05$). This indicates that the relationship between dietary diversity and learning readiness is statistically significant. Consequently, the null hypothesis, which states that there is no significant relationship

between dietary diversity and learning readiness among preschool children in FCT, Abuja, is rejected.

The finding suggests that adequate and diverse nutrition contributes significantly to early childhood cognitive and developmental outcomes. A diet that includes a variety of food groups provides essential nutrients required for brain development, energy supply, and overall physical and cognitive growth, which are crucial for children's readiness to engage in structured learning environments.

The results demonstrate that a significant and strong positive relationship exists between dietary diversity and learning readiness among preschool children in FCT, Abuja. This highlights the importance of ensuring nutritionally balanced and diverse diets for preschool children to enhance their preparedness for formal education and promote optimal cognitive development.

$H_0$3: There is no significant relationship between attention span and learning readiness in preschool children in FCT, Abuja.

Table 6: Test of Relationship between attention span and learning readiness in preschool children in FCT, Abuja

Variables	N	Mean	*r*-cal	P-value	Decision
Attention span and	200	3.50	.655	.000	Rejected
Learning readiness		3.58			

Table 6 presents the result of the Pearson Product-Moment Correlation analysis conducted to determine the relationship between attention span and learning readiness among preschool children in the Federal Capital Territory (FCT), Abuja. The table shows that the mean score for attention span is 3.50, while the mean score for learning readiness is 3.58. These mean values indicate that preschool children in the study area generally exhibit high levels of both attention span and learning readiness.

The correlation coefficient obtained from the analysis is r = 0.655, which indicates a strong positive relationship between attention span and learning readiness. This means that as the attention span of preschool children increases, their level of learning readiness also tends to increase. In practical terms, children who are able to concentrate, stay focused on tasks, follow instructions, and listen attentively during lessons are more likely to demonstrate readiness for learning activities such as recognising letters and numbers, cooperating with peers, following classroom rules, and completing simple academic tasks independently.

Additionally, the p-value of 0.000 is less than the 0.05 level of significance ($p < 0.05$), indicating that the relationship between attention span and learning readiness is statistically significant.

Therefore, the null hypothesis, which states that there is no significant relationship between attention span and learning readiness among preschool children in FCT, Abuja, is rejected.

This finding suggests that attention span is an important cognitive factor influencing children's preparedness for formal learning. The ability to sustain attention enables children to engage effectively in classroom activities, comprehend instructions, and participate actively in learning tasks.

The result indicates that a significant and strong positive relationship exists between attention span and learning readiness among preschool children in FCT, Abuja. This underscores the importance of developing children's attentional skills as part of early childhood education strategies aimed at enhancing school readiness and academic success.

DISCUSSION OF FINDINGS

The findings revealed that preschool children in the Federal Capital Territory (FCT), Abuja, generally experience moderate to relatively high dietary diversity (Sectional Mean=3.12). Parents reported that children regularly consume staple foods such as grains, roots, and tubers, as well as protein sources including meat, fish, eggs, and legumes. Dairy products were also reported to be relatively common in the children's diets. However, the findings indicated insufficient daily consumption of fruits and vegetables, which fell below the criterion mean.

This pattern suggests that while many preschool children receive energy-giving and protein-rich foods, the intake of micronutrient-dense foods such as fruits and vegetables remains limited. This finding is consistent with global and regional nutrition studies indicating that diets in many low- and middle-income settings are often dominated by staples and animal protein, while the intake of fruits and vegetables is comparatively low. Such dietary patterns may limit children's intake of essential micronutrients such as vitamins A and C, iron, and zinc that are crucial for brain development and cognitive functioning.

The result aligns with the observations of Ruel (2003) and Kennedy, Ballard, and Dop (2011), who emphasised that dietary diversity is a strong proxy for micronutrient adequacy in children's diets. Similarly, Gewa and Fernald (2020) reported that children with greater dietary diversity are more likely to meet the recommended nutrient requirements necessary for optimal cognitive development. Therefore, the moderate dietary diversity observed among preschool children in the FCT may partly support their developmental outcomes, although the limited intake of fruits and vegetables indicates an area requiring improvement.

The findings further revealed that preschool children in the study area demonstrate a relatively high level of attention span (Sectional Mean=3.50). Parents generally agreed that their children are able to focus on tasks for age-appropriate periods, follow multi-step instructions, remain attentive during short lessons, and sustain concentration during play or learning activities.

These findings suggest that many preschool children in the FCT possess adequate attentional control and task persistence, which are important indicators of early executive functioning. Attention span is a fundamental cognitive skill that supports information processing, learning engagement, and behavioural regulation in classroom settings.

The results support the theoretical perspectives of Posner and Rothbart (2017), who noted that attentional control is a key component of early cognitive development and a strong predictor of later academic performance. The findings also align with research by Best et al. (2022), which highlighted that children with better nutritional status and supportive environments tend to exhibit improved attention regulation and cognitive engagement.

The results also indicated that preschool children in the study area demonstrate a high level of learning readiness (Sectional Mean=3.58). Parents reported that their children are able to recognise letters and numbers, follow classroom rules with guidance, cooperate with peers, show curiosity about learning, and complete simple tasks independently.

These findings suggest that children enrolled in the sampled nursery schools are generally prepared to engage in structured educational activities. Learning readiness encompasses cognitive, social, emotional, and behavioural competencies that enable children to benefit from formal schooling.
The result is consistent with the assertions of Britto et al. (2017), who noted that children's readiness for school is influenced by both biological factors, such as nutrition and environmental factors, such as early learning opportunities and parental support. Similarly, UNICEF (2021) emphasised that early childhood development programs and supportive home environments significantly enhance children's readiness to learn and succeed academically.

The findings revealed a moderate positive and statistically significant relationship between dietary diversity and attention span among preschool children ($r = 0.472$, $p < 0.05$). This result indicates that children who consume a more diverse range of foods tend to exhibit better attention spans. This relationship suggests that adequate dietary diversity may contribute to improved cognitive functioning, particularly in the area of attentional control. Nutrients obtained from diverse food groups, including iron, zinc, iodine, and essential fatty acids, play vital roles in neurotransmitter activity, brain energy metabolism, and neural development. These biological processes directly influence children's ability to concentrate, regulate behaviour, and sustain attention during tasks.

The finding supports previous research by Black et al. (2013) and Grantham-McGregor et al. (2018), which demonstrated that adequate micronutrient intake during early childhood significantly influences cognitive development and attentional functioning. Similarly, studies in developing countries have shown that children with better nutritional status perform better on cognitive and behavioural assessments related to attention and executive functioning.
Another key finding of the study revealed a strong positive and statistically significant relationship between dietary diversity and learning readiness ($r=0.655$, $p< 0.05$). This indicates that children

who consume a wider variety of foods tend to demonstrate greater readiness for school learning activities.

This finding suggests that adequate nutrition supports multiple domains of development, including cognitive functioning, social behaviour, and physical well-being, which collectively contribute to school readiness. A diverse diet ensures the availability of essential nutrients required for brain maturation, memory development, energy metabolism, and behavioural regulation, all of which influence a child's ability to engage effectively in classroom learning.

The result corroborates earlier studies such as Walker et al. (2007) and Adewuni and Okoh (2021), which found that children with better nutritional status and dietary diversity exhibit higher scores in early childhood development assessments and school readiness measures. These studies emphasise that nutrition during early childhood plays a foundational role in shaping learning capacity and educational outcomes.

The findings further revealed a strong positive and statistically significant relationship between attention span and learning readiness ($r=0.655$, $p<0.05$). This indicates that children who demonstrate higher attentional control are more likely to exhibit greater readiness for formal learning.

This relationship is expected because attention span directly influences a child's ability to engage in classroom activities, follow instructions, participate in group tasks, and persist in problem-solving activities. Children with stronger attentional skills are better able to process information, retain instructions, and complete learning tasks successfully.

The result supports the work of Posner and Rothbart (2017), who highlighted that attentional regulation forms a central component of executive functioning and is a major determinant of academic success. Similarly, Britto et al. (2017) emphasised that attentional and self-regulation skills are among the most important predictors of school readiness and later academic achievement.

Collectively, the findings of this study demonstrate that nutrition and cognitive functioning are closely interconnected in shaping preschool children's readiness for learning. Dietary diversity contributes not only to children's physical health but also to their attentional capacity and overall preparedness for academic engagement. At the same time, attention span serves as a critical cognitive mechanism through which children translate their developmental abilities into effective learning behaviours.

In the context of the Federal Capital Territory, Abuja, the results highlight the importance of integrating nutrition education, parental awareness, and early childhood educational interventions to enhance children's developmental outcomes. Ensuring that preschool children have access to

diverse and nutrient-rich diets, particularly increased consumption of fruits and vegetables, may significantly improve their cognitive functioning and readiness for formal education.

CONCLUSION AND RECOMMENDATIONS

This study investigated parents' perception of the relationship among dietary diversity, attention span, and learning readiness among preschool children in the Federal Capital Territory (FCT), Abuja. The findings provide important insights into how nutritional practices and cognitive development interact to influence early childhood educational preparedness.

The results revealed that preschool children in the study area generally experience moderate dietary diversity, with most children regularly consuming staple foods, dairy products, legumes, and animal protein. However, the findings also indicated insufficient consumption of fruits and vegetables, suggesting that although children receive adequate energy and protein sources, their intake of micronutrient-rich foods may still be limited. This nutritional pattern highlights the need for improved dietary balance to support optimal cognitive and physical development during early childhood.

The study also found that preschool children demonstrate relatively high levels of attention span, indicating that many children are able to sustain focus, follow instructions, and remain attentive during learning activities appropriate for their developmental stage. Similarly, the findings revealed a high level of learning readiness among preschool children, as reflected in their ability to recognise basic academic concepts, cooperate with peers, follow classroom rules, and complete simple learning tasks independently.

More importantly, the correlational analysis revealed significant positive relationships among the variables examined. A moderate positive relationship was found between dietary diversity and attention span, indicating that children who consume a more diverse range of foods tend to demonstrate better attentional abilities. The study also found a strong positive relationship between dietary diversity and learning readiness, suggesting that nutritionally balanced diets contribute significantly to children's preparedness for formal learning environments. Furthermore, a strong positive relationship was observed between attention span and learning readiness, indicating that children who are able to sustain attention are more likely to demonstrate the cognitive and behavioural competencies required for successful participation in early education.

The findings of the study demonstrate that nutrition and cognitive development are closely interconnected determinants of early learning readiness. Adequate dietary diversity appears to support attentional functioning, which in turn enhances children's readiness to engage in structured educational activities. These findings underscore the importance of integrating nutritional awareness, parental education, and early childhood development programmes as part of strategies aimed at improving educational outcomes among preschool children in the Federal Capital Territory, Abuja.

Based on the findings of this study, the following recommendations are proposed:
1. Parents and caregivers should be encouraged to provide nutritionally balanced and diverse diets for preschool children. Special emphasis should be placed on increasing children's daily intake of fruits and vegetables, which provide essential vitamins and minerals necessary for brain development and cognitive functioning.

2. Government agencies, schools, and health organisations should organise nutrition education programmes and workshops for parents to increase awareness of the importance of dietary diversity for children's cognitive development, attention span, and school readiness.

3. Nursery schools should incorporate healthy feeding programmes and nutritional guidelines within early childhood education settings (Zubair, Nteh & Harrison, 2022). Schools can encourage parents to provide balanced lunch packs and may introduce nutrition-related learning activities to promote healthy eating habits among children.

4. Educational policymakers and child development agencies should integrate nutrition strategies into early childhood education policies. Collaborative efforts between the education and health sectors can help ensure that nutritional interventions are incorporated into preschool programmes.

5. Teachers in preschool settings should adopt interactive and play-based teaching strategies that help strengthen children's attention span, such as storytelling, puzzles, guided play, and structured classroom routines that encourage concentration and cognitive engagement.

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