HE IMPACT OF NUTRITION ON THE COGNITIVE DEVELOPMENT OF YOUNG LEARNERS IN OREDO LOCAL GOVERNMENT AREA

BY

EGHAREVBA CHARITY ESEOSA
EDU2102315

INSTITUTE OF EDUCATION
UNIVERSITY OF BENIN
BENIN CITY

NOVEMBER,2025

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A RESEARCH WRITTEN IN THE INSTITUTE OF EDUCATION, UNIVERSITY OF BENIN, BENIN CITY, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A BACHELOR'S IN EDUCATION (B.ED) DEGREE IN EARLY CHILDHOOD EDUCATION

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CERTIFICATION

We, the undersigned certify that this project, was carried out by EGHAREVBA CHARITY ESEOSA with Matriculation Number EDU2102315 in the Institute of Education, University of Benin, Benin city, Nigeria, in partial fulfillment of the requirements for the award of Bachelor of Education (B.ED Early Childhood Education)

Prof (MRS) A.I. OJEME **DATE**
(Project Supervisor)

PROF. K. ALUKO **DATE**
(Project coordinator)

DR. K. IMASUEN **DATE**
(Director, Institute of Education)

DEDICATION

I dedicate this project work with deep gratitude to the Almighty God, for His countless blessings, unmerited favour and strength all through this journey. And to all those who believed in this vision and supported in everyway, I offer my heartfelt gratitude.

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Institute of Education

University of Benin
Benin City.

Dear Respondent,
REQUEST FOR YOUR CO-OPERATION IN COMPLETING THIS QUESTIONNAIRE
I am an undergraduate student of the University of Benin, Institute of Education. I am conducting a research on the topic **"THE IMPACT OF NUTRITION ON THE COGNITIVE DEVELOPMENT OF YOUNG LEARNERS".** You have been randomly selected as one of the respondent to answer the questions. I hereby solicit your honest response in filling out the questionnaire and assure you that all information will be treated with utmost confidence**.**
Thanks for your anticipated cooperation.

Yours Faithfully,
Charity Eseosa Egharevba
(Researcher)

SECTION A
Type of School: Public ( ) Private ( )
Gender: Male ( ) Female ( )
Educational Qualification: NCE( ) OND( ) HND( ) BSC/BED ( )PGDE ( )
Years of Experience: Below ten years ( ) above ten years ( )
SECTION B
Instruction: Please tick (√) the preferably option
Strongly Agree (SA) Agree (A) Disagree (D) Strongly Disagree (SD)

S/N		SA	A	D	SD
1	Regular breakfast improves young learner's attention and focus in class**.**				
2	Balanced meals (fruits, vegetables, proteins, grains) improve young learner's memory and recall.				
3	Good nutrition improves problem-solving and reasoning skills in young learners**.**				
4	Good nutrition improves classroom participation and task completion				
5	The types of food children eat affect their academic performance				
6	Malnutrition affects children's concentration and alertness in school.				

7	Skipping meals reduces children's ability to learn effectively.				
8	Well-nourished pupils have better memory and recall ability than under-nourished pupils.				
9	Poor diet reduces children's participation in school activities.				
10	Well-nourished pupils show better attention and focus than under-nourished pupils.				
11	Well-nourished pupils participate more in class than under-nourished pupils.				
12	Nutritional status explains differences in overall cognitive development between pupils.				
13	A school feeding programme is currently running in my school.				
14	The school feeding programme improves learners' attention and concentration.				
15	The school feeding programme improves learners' memory and recall ability.				
16	The school feeding programme improves learners' participation in classroom activities				
17	Parents of the children show good knowledge of healthy nutrition for children.				
18	Parental nutrition knowledge influences the type of meals their children bring or eat at school.				
19	Children whose parents have good nutrition knowledge are more attentive in class.				
20	Parental nutrition knowledge is important for children's cognitive development.				

CHAPTER ONE

INTRODUCTION

Background of the Study

Nutrition plays an important role in the growth and development across human lifespan. From infancy to old age, the food we eat is important because it helps our body and mind stay strong and healthy or exposes us to diseases. When we eat balanced meals like fruits, vegetables, protein, carbohydrates, healthy fats, and plenty of water our body gets the right nutrients that makes our organs function well. Eating food that contains the right nutrients as humans helps in building strong bones and strengthens the immune system of the body. Nutrition plays a pivotal role in the cognitive development of children, especially during their formative years. Adequate intake of essential nutrients is crucial for brain development, influencing learning abilities, memory, and overall academic performance. Malnutrition has been considered a major health problem in Nigeria, especially in a preschool-aged child. A study conducted by Ogbuyeme et al. (2024) in Northern Nigeria showed that children in food-insecure households had an average cognitive score that was 25 per cent lower than those in food-secure households to illustrate that nutrition directly influences cognitive capacity.

Similarly, research conducted in Lagos State by the Journal of Dietitians Association of Nigeria (2024) assessed the relationship between micro-nutrient intake and cognitive performance among school-aged children. The study concluded that while feeding patterns influence micro-nutrient consumption, there wasn't a direct positive correlation between increased micro-nutrient intake and cognitive performance, suggesting that other factors may also play significant roles. Eating unhealthy food like excess sugar, fried food, soft drinks,

and ready-made snacks can be bad for our health. We might fill satisfied and full but they don’t give our body what it really needs. If we continue eating like this it may cause health problems such as having high blood pressure, diabetes, obesity, heart problems and constant fatigue or tiredness.

Emphasizing the importance of nutrition, a study in South-Western Nigeria identified stunting—a form of chronic malnutrition—as significantly associated with poor cognitive development among preschool children. Moreover, caregiver’s nutrition knowledge and access to diverse foods have been identified as critical factors influencing children's dietary diversity. In Southeast Nigeria, improved caregiver nutrition knowledge and better access to food markets were linked to enhanced dietary diversity among preschoolers, which is essential for optimal cognitive development. During the early years the type, the quality and the timing of the food or nutrition matters a lot, because it affects the brain development, learning abilities and mental performance of the children. Proper nutrition plays an important role in enhancing and shaping a child's cognitive abilities such as memory, attention, language development and problem solving ability.

In our society today, we see a lot of malnourished, underfed children and we sometimes find parents or guardians giving their wards the wrong food due to lack of knowledge, poverty, lack of time, cultural beliefs etc. This ought not to be, children from birth to at least seven years of age need food that contains some key nutrients such as iron, proteins, vitamins, fatty acids and iodine. These nutrients are essential for brain development, overall growth and nervous system support. Inadequate intake of these nutrients can lead to developmental delays, weakens their immune system and making them more likely to fall ill all the time, reduce concentration, and leading to poor academic performance.

Statement of the Problem

Nutrition plays a critical role in the cognitive development of children, particularly during early learning years when the brain undergoes rapid growth. In Nigeria, as stated by Agu & Okafor (2021), malnutrition remains a persistent public health challenge affecting school-aged children. Undernourishment and micro-nutrient deficiencies—especially iron, iodine, and vitamin A—have been linked to poor concentration, reduced academic performance, and delayed mental development Ibhaze & Inegbenebor, (2022). Moreover, the prevalence of malnutrition, including impaired growth and micro-nutrient deficiencies , has been shown to hinder cognitive functions such as memory, attention, and critical thinking.

Despite several interventions, according to Umeogu & Iwuchukwu (2023) many young learners in both urban and rural areas continue to suffer from poor dietary intake due to poverty, food insecurity, and lack of nutrition education. Similarly, Okonkwo and Adebayo (2021) also indicate that learners from undernourished backgrounds show lower memory retention and slower information processing compared to their well-nourished peers. The lack of a national school feeding policy implementation in many parts of Nigeria further worsen the issue (Ojo et al., 2022).

This problem raises concern about the long-term impact of poor nutrition on the mental capacity, school performance, and future productivity of Nigerian children. Understanding the link between nutrition and cognitive development is therefore essential for evidence-based educational and health policies. Therefore, this study aims to investigate the impact of nutrition on cognitive development of young learners.

Research Questions

The following research questions were raised to guide the study

1. What is the impact of nutrition on the cognitive development of pre - school children?
2. To what extent do the types of food children eat and malnutrition affect their academic performance?

3. Are there differences in cognitive development between well-nourished and undernourished pupils?
4. How effective are school feeding programs in improving learners' cognitive abilities?
5. What role does parental nutrition knowledge play in children's cognitive development?

Purpose of the Study

The purpose of this study is to investigate the impact of nutrition on the cognitive development of young learners. This study aims to examine how healthy eating, food types, and malnutrition affect the cognitive development and academic performance of young children, while also exploring the roles of school feeding programs and parental nutrition knowledge.

Significance of the Study

This study is significant as it sheds light on how nutrition influences several key areas of young learners' development in Nigeria. The suggestions that will be derived from this study will be beneficial for the educational sectors. Firstly, it would contribute to educational planning by providing data on how poor nutrition may hinder attention, memory, and overall academic performance. This can help schools tailor learning support for at-risk pupils.

Secondly, it would support public health initiatives by linking child nutrition with cognitive outcomes, encouraging interventions such as school feeding programs and micro-nutrient supplementation. It would also inform parenting practices, emphasizing the role of balanced diets at home and parental awareness of nutrition's long-term impact on brain function.

Thirdly, this study could guide policy-making, especially for ministries of education and health, in developing integrated child development policies. It would also be useful in teacher training programme, equipping educators to identify signs of malnutrition and respond appropriately.

Lastly, it would contribute to future research by filling gaps in local evidence on nutrition and cognition, especially within the Nigerian context between 2020 and 2024.

Scope and Delimitation of the Study

The scope of the study focused on the impact of nutrition on the cognitive development of pre - school children. It is delimited to pre - schools in Oredo Local Government area of Edo State.

Operational Definition of Terms

1. **Cognitive Development** – How a child's brain grows and learn to think, remember, solve problems, and pay attention.
2. **Impact** - This refers to the effect or change something causes.
3. **Nutrition** – The intake of food and its effect on the body's growth, development, and functioning.
4. **Young Learners** – Children, typically aged 2–6years, who are still learning basic skills or in their early stage of formal education.

CHAPTER TWO

LITERATURE REVIEW

This chapter presents the review of related literature relevant to the impact of nutrition on the cognitive development of young learners. The following sub-headings were extensively discussed:

- Theoretical Framework
- Concept of Nutrition
- Impact of Healthy Eating on Cognitive Development of Young Children?
- How the Type of Food Children Eat and Malnutrition Affect Their Academic Performance?
- The Difference in Cognitive Development between Well-nourished and Undernourished Pupils?
- How Effective Are School Feeding Programs In Improving Learners Cognitive Abilities?
- The Role Parental Nutritional Knowledge Play in Children's Cognitive Development?
- Summary of the reviewed literature

Theoretical Framework

There are a number of theories that can be used to depict the impact of nutrition on the cognitive development of young learners. The most relevant ones are discussed below;

1. Piaget's Cognitive Development Theory

Jean Piaget, a Swiss psychologist renowned for his contribution to development psychology and development. His cognitive development theory focuses on how children construct knowledge through active interaction with their environment.

Piaget's theory of cognitive development emphasizes that a child's cognitive development is intertwined with their ability to learn and understand the world, including nutrition. According to Piaget, Proper nutrition is essential for optimal brain development and function, which directly impacts a child's ability to progress, through Piaget cognitive development stages. Deficiencies in key nutrients can hinder cognitive development, potentially affecting learning, concentration, and overall cognitive abilities.

Key milestone of Piaget's Stages and Nutrition:

i. **Sensorimotor Stage (0-2 years):** This stage is characterized by exploration through senses and movement. Adequate nutrition, especially essential fatty acids and iron, supports brain growth and development, crucial for building foundational cognitive skills like object permanence.

ii. Preoperational Stage (2-7 years): Children develop symbolic thinking and begin to use language. Nutrition, including iron and zinc, supports language development and the ability to engage in symbolic play, which is central to this stage.

iii. Concrete Operational Stage (7-11 years): In this stage of development, Children start to think logically and understand concepts like conservation. Adequate nutrition, particularly iron and zinc, supports the cognitive processes necessary for logical reasoning and problem-solving.

iv. Formal Operational Stage (11+ years): Adolescents develop abstract thinking and the ability to reason hypothetically. A balanced diet with essential nutrients continues to support brain function and cognitive development.

For preschool children in particular, the preoperational stage is crucial as it lays the foundation and determines the performance at the next stages of development. Piaget's constructivism theory has meaningful prospects for the cognitive development of preschool children. The impact of nutrition education on young learners can facilitate preschool children's cognitive development in the following ways:

i. Age-Appropriate Education: Piaget's theory emphasizes that nutrition education should be tailored to the child's developmental stage.

ii. Hands-on Activities: According to Piaget theory, engaging children with hands-on activities related to food and nutrition can help them understand concepts and develop healthy eating habits.

iii. Cultural Relevance: In Piaget's theory, Nutrition education should be culturally relevant to ensure that children can connect with the information and apply it to their lives.

iv. Parental Involvement: Piaget believed involving parents in nutrition education is crucial for boosting healthy eating habits at home.

Generally, Piaget's theory remains a foundation as it highlights the importance of cognitive development, which is heavily influenced by nutrition. A balanced diet provides the essential nutrients necessary for optimal brain growth and function, supporting a child's ability to progress through the stages of cognitive development. By aligning nutrition education with Piaget's stages, educators and parents can help children develop healthy eating habits and reach their full cognitive potential.

2. **Maslow's Hierarchy of Needs**

Abraham Maslow, an American psychologist best known for developing the Hierarchy of Needs theory. His idea emphasises, that human beings are motivated by a series of needs, arranged in a pyramid from basic survival needs to higher-level personal growth Maslow (1943). Maslow placed nutrition at the very bottom of the pyramid — under

physiological needs to show they are basic requirements for survival, such as food, water, air, and sleep. The impact of nutrition based on his principles I'm the hierarchy of needs can help young learners cognitive development in the following ways;

1. **Physiological Needs (Basic Survival Needs):** Maslow's theory highlights that, nutrition is fundamental to meeting physiological needs. Adequate intake of essential nutrients is crucial for brain development and overall health in children. A child will not be able to concentrate or learn effectively because their body and brain lack the fuel needed for thinking and focus.

2. Safety Needs (Health and Well-being): Maslow's theory also recognize consistent access to nutritious food as it contributes to a child's sense of safety and well-being. As nutrition is satisfied, children feel healthier, safer, and more ready to learn. This supports safety needs, which boost mental calm and emotional stability key for cognitive growth.

3. Love and Belonging (Social Relationships): According to Maslow theory, proper nutrition enables children to engage more effectively in social interactions, fostering a sense of belonging. Once the basic needs are met, a child can build confidence, interact with peers, and perform well in school.

4. Esteem Needs (Confidence and Achievement): Maslow's theory emphasizes adequate nutrition as contributes to better academic performance, enhancing self-esteem among young learners.Good nutrition supports better school performance, which helps children feel proud of themselves. When children do well academically, they feel confident, respected, and motivated to keep learning.

5. Self-Actualization (Realizing Potential): In his theory, this the highest level, where a child reaches their full potential. With proper nutrition and support through all the earlier stages, a child can think creatively, solve problems, and grow intellectually to their best ability. Meeting all the previous needs allows children to reach self-actualization, where they can fully realize their cognitive potential.

Briefly, Maslow's theory explains that without good nutrition, cognitive development is limited, because the brain and body must first meet survival needs before higher learning can occur.

3. Bronfenbrenner's Ecological Systems Theory

Urie Bronfenbrenner, a Russian-American psychologist renowned for the development of the Ecological Systems Theory. His theory assume that a child's development is influenced by different layers of environmental systems that interact with one another Bronfenbrenner (1979). Bronfenbrenner emphasized that children do not grow in isolation; rather, their development including cognitive abilities is shaped by relationships and settings they experience daily, such as family, school, community, and cultural values. His theory feature some systems that impact young learners and facilitie their cognitive development in the following ways;

1. **Microsystem (Immediate Environment):** According to Bronfenbrenner, the child's closest relationships (parents, teachers, caregivers) directly influence their nutritional intake because this is where nutrition decisions are made. When caregivers provide balanced meals at home or through school feeding programs, it directly supports the child's brain development and concentration levels. For example, a child who eats breakfast is more likely to stay alert and perform better in class.

2. Mesosystem (Connections Between Microsystems): His theory stresses that, relationship between home and school is key, and can reinforce good nutrition. If parents and teachers work together to ensure children eat well, this double support enhances learning outcomes. For instance, a parent attending nutrition education sessions at school may start packing healthier meals for their child.

3. Exosystem (Indirect Environment): According to Bronfenbrenner, external systems like community health centers, policies or a parent's workplace can affect nutrition indirectly. A mother's job that offers maternity leave and health insurance may allow her to better nourish her child, indirectly improving the child's cognitive outcomes.

4. Macrosystem (Cultural and Societal Influences): In Bronfenbrenner's view, Cultural beliefs and national policies about nutrition, food availability, and education greatly impact what children eat. For instance, a government's school feeding initiative in Nigeria can ensure even low-income children receive daily nutritious meals, supporting their brain development.

5. Chronosystem (Time and Life Transitions): Bronfenbrenner's theory emphasizes that, over time, changes in diet, lifestyle, or socio-economic status can affect a child's nutrition and cognitive growth. A shift from breastfeeding to processed foods without proper guidance, for example, can hinder early cognitive progress.

Conclusively, Bronfenbrenner's theory provides a robust framework for understanding that a child's nutrition and cognitive development are not just biological but also social and environmental issues. Supporting nutrition across the child's environment including home, school, and policy, leads to better cognitive outcomes.

2. **The Developmental Origins of Health and Disease (DOHaD) Theory**

Dr. David James Purslove Barker (1938–2013), a British physician and epidemiologist renowned for his groundbreaking work in public health and medicine. He is best known for formulating the Barker Hypothesis, which later evolved into the Developmental Origins of Health and Disease (DOHaD) theory. His theory posits that poor nutrition during pregnancy and early childhood could lead to increased risks of chronic diseases like heart disease and diabetes in adulthood.

The DOHaD theory proposes that the environment and nutrition a child is exposed during early childhood can permanently affect how their organs, including the brain, develop and function. This includes cognitive areas like memory, attention, and learning capacity.

Key aspects of the theory include:

1. **Fetal Programming:** The concept that the fetus adapts to its environment (e.g., maternal nutrition, stress) through physiological and epigenetic changes. These adaptations can have lasting effects on metabolism, organ development, and disease susceptibility.

2. **Early Life Nutrition:** Environmental factors, such as maternal nutrition, can alter gene expression through mechanisms like DNA methylation and histone modification. These changes may predispose individuals to chronic diseases later in life.

3. **Mismatch Hypothesis:** If the environment the fetus anticipates (based on maternal cues) differs significantly from the postnatal environment, the individual may face increased risks of metabolic disorders, obesity, and other health issues.

The DOHaD theory has meaningful prospects for understanding the relationship between early nutrition and cognitive development:

1. Nutritional Deficiencies and Brain Development: Adequate maternal nutrition during pregnancy is critical for fetal brain development. Nutritional deficiencies, such as a lack of essential fatty acids, iron, or iodine, can impair neuro development, leading to cognitive deficits in childhood. Studies of historical famines, such as the Dutch Hunger Winter, have shown that children exposed to malnutrition in utero had lower cognitive performance and higher risks of neuro developmental disorders later in life.

2. Epigenetic Mechanisms: Nutritional challenges during pregnancy can lead to epigenetic changes in genes related to brain function and learning. For example, altered DNA methylation patterns may affect neural plasticity, memory, and learning capacity.

3. Long-Term Educational Outcomes: Research has linked low birth weight and poor early nutrition to lower test scores, reduced educational attainment, and diminished cognitive abilities in adulthood. These findings underscore the importance of maternal and early childhood nutrition in shaping cognitive potential.

Dr. David J. Barker's theory has revolutionized the understanding of how early-life factors, particularly nutrition, influence lifelong health and cognitive development. The theory highlights the critical role of maternal and early childhood nutrition in shaping not only physical health but also cognitive outcomes in young learners. By addressing nutritional deficiencies during these formative periods, it is possible to improve both health and educational trajectories for future generations.

In relation to young learners, Baker's theory assumes that, poor early nutrition can disrupt brain development, leading to reduced cognitive abilities, lower school performance, and delayed milestones. Adequate maternal and childhood nutrition helps form strong neural connections, supports attention span, and enhances academic outcomes. And the theory supports the need for early interventions, such as school feeding programs and nutrition education, to improve cognitive outcomes later in life.

The DOHad theory states that, proper nutrients during pregnancy and early childhood supports brain growth and development. Essential nutrients include:

i. **Folate:** crucial for fetal brain development
ii. **Iron:** necessary for healthy brain function
iii. **Zinc:** supports immune system and brain development

iv. **Maternal Nutrition:** a well-balanced diet during pregnancy supports fetal brain development

In conclusion, Dr. David J. Barker's work on the DOHaD theory has revolutionized the understanding of how early-life factors, particularly nutrition, influence lifelong health and cognitive development. The theory highlights the critical role of maternal and early childhood nutrition in shaping not only physical health but also cognitive outcomes in young learners. By addressing nutritional deficiencies during these formative periods, it is possible to improve both health and educational trajectories for future generations.

Concept of Nutrition

Nutrition is the science that interprets the interaction of nutrients and other substances in food in relation to growth, reproduction, health, and maintenance of the human body. Nutrition also refer to the intake of food, considered in relation to the body’s dietary needs. It encompasses the processes by which living organisms receive and utilize the materials necessary for the maintenance of life, growth, and functioning. Nutrition is a vital aspect of human health and development, influencing not only physical well-being but also cognitive growth, especially in young learners. A well-balanced diet rich in essential nutrients supports brain development, enhances cognitive function, and improves academic performance.

Some philosophers view of Nutrition vary based on their educational ideology. For instance, proponent of constructivism, like Piaget emphasizes the role of nutrition in supporting brain development and function. While, ecological system theorist like, Bronfenbrenner opined the role of environmental factors in child development, including nutrition Eze et al. (2024). He argues that a child's development is influenced by their immediate environment, which includes access to nutritious food. Similarly, Maslow posits that physiological needs, including nutrition, must be met before individuals can pursue

higher-level psychological and self-fulfillment needs Satter (2020). This framework suggests that without adequate nutrition, children may struggle to achieve their full cognitive potential.

Nutrition have been defined by various authors, though it all mean the same if thoroughly interpreted. Adepoju & Adejumo (2021) define nutrition as a core component of early childhood development, noting that "without adequate and balanced nutrient intake, brain function in children becomes impaired, leading to reduced learning outcomes." According to the World Health Organization (WHO), nutrition is a critical part of health and development. Adequate nutrition is directly linked to improved infant, child, and maternal health, stronger immune systems, safer pregnancies and childbirth, reduced risk of non-communicable diseases (such as diabetes and cardiovascular conditions), and increased life expectancy. Proper nutrition in children enhances learning ability, concentration, and overall academic performance. Moreover, well-nourished individuals are generally more productive and capable of contributing meaningfully to society, thereby helping to break the cycle of poverty and hunger.

Malnutrition, as a related concern, poses serious threats to human health. The WHO identifies a double burden of malnutrition, especially in low- and middle-income countries. This includes both undernutrition (such as stunting and wasting) and overnutrition (overweight, obesity, and diet-related diseases). These multiple forms of malnutrition have far-reaching developmental, economic, and health impacts—not just on individuals, but also on families, communities, and nations as a whole.

Recent global estimates indicate that approximately 149.2 million children under the age of five are stunted (too short for their age), while 45.4 million are wasted (underweight for their height). Although global rates of stunting are decreasing, Africa remains the only region where stunting is still rising, highlighting a critical public health concern. Additionally, over 75% of children with severe wasting live in Asia, where food insecurity and poor dietary

diversity are prevalent. Undernutrition is linked to approximately 45% of deaths among children under five, particularly in low - and middle-income countries. Beyond increasing child mortality, undernutrition significantly impacts a child's brain development, learning capacity, and academic performance. Chronic malnutrition, especially during the first five years of life, can lead to irreversible cognitive delays, reduced attention span, and poor school readiness—ultimately affecting the child's lifelong potential.

Moreover, The food children eat gives them the nutrients and energy they need, and also helps their body make healthy blood, but if the body doesn't have enough blood, it can cause a sickness called anaemia. Anaemia is a serious global public health problem that particularly affects young children and pregnant women. WHO estimates that 40% of children less than 5 years of age and 37% of pregnant women worldwide are anaemic. Thirty percent of women of reproductive age have anaemia. Globally, 1.9 billion adults are overweight or obese and 38.9 million children under 5 years of age are overweight. Rates of childhood overweight and obesity are rising, particularly in high-income and upper-middle-income countries. Although, breastfeeding protects against undernutrition and overweight, only 44% of infants under 6 months of age are exclusively breastfed. High sodium consumption (>5 g salt/day) contributes to high blood pressure and increases the risk of heart disease and stroke. Most people consume too much salt – on average 9–12 grams per day, or around twice the recommended maximum level of intake.

Nutrition is a multifaceted concept that encompasses various components essential for maintaining health and supporting bodily functions. The primary components of nutrition can be categorized into macronutrients and micronutrients, each playing a vital role in overall well-being.

1. **Macronutrients:** Macronutrients are nutrients required by the body in large amounts. They provide the energy necessary for daily activities and are crucial for growth and development. The three main macronutrients are:

i. **Carbohydrates:** These are the body's primary source of energy. Carbohydrates can be classified into simple and complex forms. Simple carbohydrates, found in sugars, provide quick energy, while complex carbohydrates, such as whole grains and legumes, offer sustained energy and are rich in fiber, which aids digestion and helps maintain stable blood sugar levels.

ii. **Proteins:** Composed of amino acids, proteins are essential for building and repairing tissues, producing enzymes and hormones, and supporting immune function. Sources of protein include meat, fish, dairy products, legumes, and nuts. The body requires a balanced intake of essential amino acids, which are obtained through dietary protein.

iii. **Fats:** Fats are a concentrated source of energy and are necessary for the absorption of fat-soluble vitamins (A, D, E, and K). They also play a role in hormone production and cell structure. Healthy fats, such as those found in avocados, nuts, seeds, and fatty fish, are important for heart health, while saturated and trans fats should be limited to reduce the risk of chronic diseases OIST Groups (2025).

2. Micronutrients: Micronutrients, which include vitamins and minerals, are required in smaller amounts but are equally important for health. They support various physiological functions, including metabolism, immune response, and bone health. Deficiencies in these nutrients can lead to significant health issues, including impaired cognitive function and increased susceptibility to diseases Ecker et al., (2020). Key micronutrients include:

i. Vitamins: These organic compounds are crucial for energy production, immune function, and blood clotting. For example, vitamin C is important for immune health and skin integrity, while B vitamins are essential for energy metabolism CDC (2025).

ii. Minerals: Inorganic elements such as calcium, iron, and zinc play vital roles in growth, bone health, and fluid balance. Iron is particularly important for oxygen transport in the blood, and deficiencies can lead to anemia, which affects energy levels and cognitive function WHO (2022).

iii. Water: Water is often overlooked but is a critical component of nutrition. It is essential for maintaining hydration, regulating body temperature, and facilitating biochemical reactions. Adequate water intake is necessary for optimal health, as dehydration can impair physical and cognitive performance Food Finders Food Bank (2025).

Understanding the key components of nutrition—macro-nutrients, micro-nutrients, and water—is essential for promoting health and preventing disease. A balanced diet that includes a variety of foods from all these categories can help ensure that individuals meet their nutritional needs and maintain overall well-being.

Impact of Nutrition on the Cognitive Development of pre-school Children

Healthy eating during early childhood is critical for cognitive development, as it provides essential nutrients that support brain growth, function, and learning abilities. According to World Health Organization (2020) healthy dietary habits starting from birth, including breastfeeding, enhance cognitive development and long-term health outcomes.

Similarly, Otinwa et al. (2023) emphasizes that the dietary habits of children significantly contribute to their cognitive development and academic performance. It simply mean that children who consume a balanced diet, rich in proteins and essential nutrients, exhibit better attention spans and learning outcomes. Nutrition is vital for maintaining health and cognitive function, suggesting that children who are well-nourished tend to perform better in school and have improved cognitive abilities (Otinwa, Jaiyesimi, Bamitale, & Habeeb, 2023).

Lundborg et al. (2022) established that nutrition programs providing balanced diets improve academic performance, reduce absenteeism, and enhance cognitive abilities. These programs have long-term economic benefits by increasing the likelihood of higher educational achievements. Suntwist (2021) stresses the importance of ensuring proper nutrition for children, describing it as a cornerstone for their future leadership and societal contributions. In the same vein, Odukoya (2024) discusses the importance of specific nutrients, such as omega-3 fatty acids, vitamins, and minerals, in enhancing cognitive functions. The study highlights that foods like fatty fish, beans, and leafy greens are particularly beneficial for brain health. These foods provide essential nutrients that support cognitive functions, including memory and concentration, which are critical for academic success. Effects of Specific Nutrients on Cognitive Development:

i. Omega-3 Fatty Acids: According to Demmelmair et al. (2019) and Øyen et al. (2018) increase fish consumption (rich in omega-3s) improves cognitive outcomes, including verbal reasoning, fine motor skills, and processing speed. However, no significant differences were observed in overall IQ scores.

ii. Iron and Micronutrients: A study by Black et al. (2021) posit that fortified meals containing iron, zinc, and vitamins improved expressive language and social-emotional development in children attending low-quality preschools.

iii. Choline: Maternal or child supplementation with choline supports normal brain development, as noted in systematic reviews. Schneider et al. (2018) suggest that combining nutritional interventions with psychosocial stimulation yields superior cognitive outcomes, particularly in undernourished children. Ryan & Nelson (2008) affirms a positive association between DHA levels and improved listening comprehension and vocabulary, emphasizing the importance of omega-3 supplementation.

In addition, Metallinos-Katsaras et al. (2004) and Roberts et al. (2020) highlights the importance of nutrition during the preschool years (second 1000 days of life). Nutritional interventions during this period significantly improve cognitive abilities, including working memory and problem-solving skills. Bostwick et al. (2024) observed that consuming a high-quality breakfast (rich in fruits, vegetables, dairy, and whole grains) enhances motivation and academic achievement. MacPherson (2024) argues that poor diets during early childhood promote inflammation, inhibiting brain growth and cognitive development. Conversely, diets that reduce inflammation foster better neural connections and learning abilities.

Conversely, Malnutrition during early childhood can lead to developmental delays and poor academic performance later in life. Huang et al. (2023) asserted that malnutrition not only affects cognitive development but also poses risks for metabolic disorders and non-communicable diseases later in life. Hameed & Salibi (2023) revealed that malnourished children are at a higher risk of experiencing cognitive deficits. The research indicates that stunting, a form of malnutrition, is significantly associated with poor cognitive performance. The authors advocate for interventions aimed at improving the nutritional status of children to enhance their cognitive development and overall well-being.

How the Type of Food Children Eat and Malnutrition Affect Their Academic Performance?

The type of food and malnutrition has a special impact in shaping the academic performance of young learners, Nigeria specifically. The brain, which uses about 20% of the body's daily caloric intake, requires adequate nutrients to function optimally. When children eat balanced meals rich in essential vitamins, proteins, and minerals, they are better equipped to concentrate, retain information, and stay alert in class. In contrast, malnutrition—caused by poor diet or insufficient intake—can lead to fatigue, reduced attention span, and cognitive delays. Just as historical figures like Albert Einstein and Marie Curie thrived by harnessing

their cognitive abilities, today's young learners need proper nutrition to unlock their full academic potential. According to World Food Programme (2023) malnutrition affects approximately 200 million children globally, with significant implications for their educational outcomes. Children suffering from stunting, a form of chronic malnutrition, are more likely to drop out of school and earn less in adulthood, translating to substantial economic losses for their communities.

In Nigeria, the situation is particularly alarming. Ojo et al. (2023) opines that malnutrition is a leading cause of poor academic performance among school-aged children. They argue that interventions such as school feeding programs are crucial in addressing these nutritional deficiencies and improving educational outcomes. A study by Otinwa et al. (2023) highlights that, urban children had better access to a variety of foods, rural children often consumed more natural and healthier options. The researchers concluded that healthy eating habits during childhood are foundational for intellectual well-being and protect against diseases that affect learning and functional capacity.

Babatunde (2024), a registered nutritionist, emphasized the critical nature of the first 1,000 days of life—from conception to age two—for brain development. She noted that nutritional deprivation during this period could lead to neurological decline, motor skill delays, and reduced brain size. These deficiencies can result in children losing between 5 to 11 IQ points, facing challenges in learning, and struggling with developmental milestones. Such children often exhibit low energy levels and impaired neuropsychological abilities, leading to difficulties in classroom engagement and poor academic performance. This then means, nutrition complement the development and makes learning complete.

Can we separate nutrition from academic performance? Is there a direct link between the two? A qualitative study by Nwankwo et al. (2024) revealed the perceptions of teachers regarding the impact of nutrition on student performance. Teachers reported that students

with poor nutritional status often exhibited behavioral issues, such as irritability and lack of focus, which hindered their learning. Hence, it is plausible that the poor performance in learners' performance, may be attributed to the nature of nutritional intake. This aligns with findings from Mukasa (2025), who noted that malnourished children are less likely to participate actively in class, further exacerbating their academic challenges. Nutrition impacts academic performance of learners in diverse ways;

i. Aid brain development by supporting cell production, enhancing cell size and complexity, and facilitating cognitive growth. Since the brain is the center of intellectual activity, a balanced supply of essential nutrients in the right quantities directly influences academic performance.
ii. Affects attention span because a child’s ability to learn is influenced not just by external distractions but also by internal factors like malnutrition. Unlike external distractions, the effects of poor nutrition are harder to control and can hinder proper brain function.
iii. Makes learners active. Healthy eating ensures the body functions properly. However, when essential nutrients are lacking, students fail to meet the recommended dietary allowance (RDA) for energy, leading to hunger, fatigue, and disinterest in learning. This can result in irregular school attendance, reducing exposure to vital educational experiences and limiting academic achievement. The quality and quantity of nutrients our bodies receive significantly impact our cognitive function and overall performance.

The Difference in Cognitive Development between Well-nourished and Undernourished Pupils

Undernutrition is a problem worldwide, infants and young children, belonging to the poor socio-economic classes, being the most vulnerable segments of population. A study by

Ojo et al. (2023) reports that undernourished children often exhibit lower cognitive abilities, including impaired memory, attention, and problem-solving skills. This simply means that these cognitive deficits can lead to poor academic performance and reduced opportunities for future success among youmg learners. Targeted nutritional interventions can significantly improve cognitive outcomes in malnourished children Afolabi et al. (2024). Children who received a diet enriched with essential nutrients showed marked improvements in cognitive tests compared to those who did not receive such interventions. This suggests that addressing nutritional deficiencies can help mitigate some of the cognitive impairments associated with malnutrition. Beyond general nutrition, children who ate breakfast were more actively, had better memory, and understood lessons faster than those who skipped it. This means even day-to-day meals can affect how well the brain functions in class. UNICEF (2023) highlight that Nigeria still has one of the highest rates of child stunting in the world, and this is strongly linked to lower learning ability and reduced future productivity. In the same vein, Mukasa (2025) asserted that children who experience malnutrition in their formative years are at a higher risk of developing chronic cognitive issues that persist into adulthood. This is particularly concerning in Nigeria, where malnutrition rates are high, affecting millions of children and hindering their educational and economic prospects. Nwankwo et al. (2024) observed that malnutrition is associated with increased irritability, anxiety, and difficulty in social interactions, which can negatively affect classroom behavior and peer relationships. These emotional and behavioral challenges compound the cognitive deficits, creating a cycle of underachievement. He propose that there's need for the implementation of comprehensive school feeding programs alongside regular health and nutrition assessments to reduce the effects of malnutrition on children's behavior and learning. It therefore mean that psychosocial support and nutrition education for families may help address emotional and cognitive challenges in affected pupils.

Eze et al., 2024; Ogundipe & Adesina (2024) also emphasize that poor diets, especially lack of iron and iodine, continue to harm children's brain growth and learning outcomes. In simple terms, a well-nourished child is usually more alert, remembers better, and learns faster, while an undernourished child often struggles to focus, forgets quickly, and performs below potential—not because they are less intelligent, but because their brain is not getting the right fuel and building blocks it needs. This shows why balanced meals, school feeding, iron- and iodine-rich foods, and proper care in the early years are so important for a child's thinking and learning ability in Nigeria today.

How Effective Are School Feeding Programs In Improving Learners Cognitive Abilities

School feeding programs (SFPs) have been widely recognized for their potential to improve learners' cognitive abilities, particularly in developing countries like Nigeria. School feeding programs are designed to provide children with nutritious meals that can enhance their cognitive development.

Several studies have shown that, school feeding programs are essential for the cognitive development of young learners. SFPs significantly improve the nutritional status of children, which is directly linked to better cognitive performance Alabi & Ibrahim (2024). This implies that, adequate nutrition is essential for brain development, particularly in young learners who are still growing. Rakiya (2022) observed that the provision of regular meals through school feeding programs helps alleviate short-term hunger, which enhances children's attention spans and cognitive abilities. This indicates that children who receive nutritious meals are more likely to engage actively in classroom activities, leading to improved academic performance.

A study by Jacob & Musa (2021) found that the National Home-Grown School Feeding Programme (NHGSFP) led to a 30% increase in pupil enrollment in public primary schools. This increase in school attendance is crucial, as consistent school participation is linked to better cognitive outcomes over time. Firman and Nandiyanto (2023) also identified the school feeding program as a multi-sectoral intervention with positive impacts on education, health, and nutrition, and noted its potential for long-term benefits. However, they emphasized that to a hungry child, the value of the program lies not just in its existence but in the adequacy and nutritional quality of the food provided. Dada, Ogundele, Nuhu, Jinadu and Ogunfeyintimi (2024) are of the opinion that the children attend school because they are sure they will get at least one nutritious meal to eat and that this increases enrolment and encourages consistent attendance to school as well as helping to improve overall performance of the pupils.

A critical component of effective education system is school feeding policies which are meant to improve the children's health and nutrition to impact their school attendance, ability to learn and overall development. Sesonga (2016) emphasised that it was after the introduction of school feeding program in Ruwanda that significant improvement on pupils performance was achieved, number of dropouts and absenteeism reduced, there was an increase in school enrollment of pupils in schools and the learning process improved.

School feeding programmes have been shown to improve children's thinking and learning abilities mainly by tackling hunger and poor nutrition. When children come to school hungry, they often feel weak, distracted, and find it hard to pay attention. By providing a regular meal, these programmes give pupils the energy to concentrate, remember lessons, and actively take part in class. Similarly, Alabi & Ibrahim (2024) that feeding programmes help pupils attend more regularly and perform better in school because they are not distracted by hunger.

The Role Parental Nutritional Knowledge Play in Children's Cognitive Development

Parental nutrition knowledge plays an important role in children's cognitive development, particularly in the context of Nigeria, where malnutrition remains a significant public health concern. According to Okwor et al. (2023), parents with better nutrition knowledge are more likely to provide balanced diets for their children. Children whose parents understood the importance of various nutrients, such as proteins, vitamins, and minerals, exhibited better cognitive performance in school. Nweze et al. (2024) established, that when parents participated in educational workshops about nutrition, there was a significant improvement in their children's cognitive abilities. Parental knowledge can lead to better food choices and improved nutritional status. Socioeconomic backgrounds tend to have better access to nutrition education and resources, leading to healthier dietary practices for their children Balogun-Kuku (2023). This disparity can result in significant differences in cognitive outcomes, as children from well-nourished backgrounds generally perform better academically.

Summary of the Reviewed Literature

The literature reviewed the impact of nutrition on the cognitive development of young learners. Supported by four key theories: Piaget's cognitive development stages showing how proper nutrition supports brain growth at each developmental phase, Maslow's hierarchy demonstrating that basic nutritional needs must be met before higher learning can occur, Bronfenbrenner's ecological systems theory highlighting how environmental factors across home and school influence nutritional intake, and Barker's Developmental Origins of Health and Disease theory emphasizing how early nutrition affects lifelong cognitive outcomes. It can be asserted that healthy eating significantly impacts children's cognitive abilities and academic performance. Studies demonstrate that well-nourished children exhibit better attention spans, memory, and learning outcomes compared to their undernourished peers, with specific nutrients like omega-3 fatty acids, iron, and vitamins playing crucial roles in

brain development. Research from Nigeria and other developing countries shows that malnutrition leads to cognitive deficits, behavioral problems, and poor academic achievement, with children losing 5-11 IQ points due to nutritional deprivation during critical developmental periods. School feeding programs emerge as effective interventions for improving cognitive abilities, with studies showing increased enrollment, reduced absenteeism, and enhanced academic performance among participating children. Parental nutritional knowledge also plays a vital role, as educated parents who understand the importance of balanced diets are more likely to provide adequate nutrition that supports their children's cognitive development. The evidence consistently supports the critical connection between proper nutrition and optimal cognitive functioning in young learners, particularly during the first 1,000 days of life when brain development is most rapid.

CHAPTER THREE

METHODOLOGY

This chapter described the research method that was used in carrying out the study. The chapter was organized under the following sub-headings;

- Research Design
- Population of the study
- Sample and sampling techniques
- Research instruments
- Validity of the instrument
- Reliability of the instrument
- Method of data collection
- Method of data analysis

Research Design

The research design used for this study is the descriptive survey method. This research design is considered appropriate as it collects data on the impact of nutrition on the

cognitive development of young learners as they exist, without any manipulation of the subjects.

Population of the Study

The targeted population of this study is made up of all the teachers in both private and public pre - schools in Oredo Local Government Area, Benin City, Edo State.

Sample and Sampling Technique

A sample size of Eighty (80) respondents was randomly selected from Ten (10) schools in the Oredo Local Government Area of Edo State. Five (5) private schools and five (5) public schools were selected for the survey. In each school eight (8) teachers were selected, making a total of eighty (80) teachers who participated in the study.

The technique used to select the respondents for the study was the random sampling technique.

Research Instrument

The research instrument used for the study was a structured questionnaire titled: Impact Of Nutrition On The Cognitive Development Of young Learners. The questionnaire was divided into two sections. Section A sought the respondents demographic detail. Section B comprised of twenty items geared towards gathering needed data for the study.

Validity of the Instrument

The validity of the instrument was ascertained by the researcher's supervisor with regards to relevance of the research topic, content coverage, language appropriateness and clarity of expression. Appropriate corrections were made on the questionnaire by the supervisor before it was deemed fit for the study.

Reliability of the Instrument

The reliability of the instrument was obtained using Cronbach Alpha where a co-efficient was obtained which indicate that the instrument used was reliable giving a coefficient of 0.75. Test retest method of establishing reliability was used for the study.

Method of Data Collection

The data for this research was collected with questionnaire administered in person by the researcher to the respondents in the sampled area of study. This approach ensured proper and accurate completion of the questionnaire. A total of eighty (80) questionnaires were administered to eighty respondents in ten (10) randomly selected schools. The questionnaires were issued and the completed instrument were collected on the spot to ensure a high response rate.

Method of Data Analysis

The data gathered were analyzed using mean and standard deviation methods. A mean criterion of 2.50 which was the arithmetic mean of 4 point like scale was used for the acceptance of the items.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS

This chapter deals with the presentation, results and the discussion of findings.

Research Question One

What is the impact of nutrition on the cognitive development of pre-school children in Oredo local Government Area of Edo State?

Table 1: The Impact of Nutrition on the Cognitive Development of Pre-School Children

Statement	Mean	Standard deviation	Remark
A regular breakfast improves young learners' attention and focus in class.	3.68	0.47	Agree
Balanced meals (fruits, vegetables, proteins, grains) improve young learners' memory and recall.	3.71	0.46	Agree
Good nutrition improves problem-solving and reasoning skills in young learners.	3.45	0.55	Agree
Good nutrition improves classroom participation and task completion	3.39	0.61	Agree
Grand mean	**3.56**	**0.52**	

Source: Field survey, 2025.

The findings from Table 1 reveal that there was consensus that regular breakfast, balanced meals, and good nutrition contribute significantly to children's attention, memory, problem-solving, and classroom participation. The grand mean of 3.56 indicates a nutrition impacts various dimensions of cognitive functioning to a high degree. This suggests that good nutritional practices play a fundamental role in fostering early cognitive growth and academic readiness among preschool learners.

Research Question Two

To what extent do the types of food children eat and malnutrition affect their academic performance?

Table 2: The Extent to Which the Types of Food Children Eat and Malnutrition Affect Their Academic Performance

Statement	Mean	Standard deviation	Remark
The types of food children eat affect their academic performance	3.23	0.78	Agree
Malnutrition affects children's concentration and alertness in school.	3.51	0.55	Agree
Skipping meals reduces children's ability to learn effectively.	3.27	0.66	Agree
Well-nourished pupils have better memory and recall ability than under-nourished pupils.	3.21	0.85	Agree
Grand mean	**3.31**	**0.71**	

Source: Field survey, 2025.

The results in Table 2 indicate that malnutrition, meal skipping, and poor dietary habits negatively affect children's concentration, alertness, and learning efficiency. Conversely, well-nourished pupils tend to demonstrate stronger memory retention and cognitive alertness. The grand mean of 3.31 indicates that participants agreed that the types of food children eat and their nutritional status significantly influence their academic performance.

Research Question Three

Are there differences in cognitive development between well-nourished and undernourished pupils?

Table 3: Differences in Cognitive Development between Well-Nourished and Undernourished Pupils

Statement	Mean	Standard deviation	Remark
Poor diet reduces children's involvement in school activities.	3.29	0.68	Agree
Well-nourished pupils show better attention and focus than under-nourished pupils.	3.15	0.89	Agree
Well-nourished pupils participate more in class than under-nourished pupils.	3.18	0.84	Agree
Nutritional status explains differences in overall cognitive development between pupils.	3.05	0.71	Agree
Grand mean	**3.17**	**0.78**	

Source: Field survey, 2025.

The findings presented in Table 3 show that pupils who consume adequate and balanced diets exhibit higher levels of attention, engagement, and participation in classroom activities compared to those who are undernourished. The grand mean of 3.17 reflects moderate agreement that there are observable differences in cognitive development between well-nourished and undernourished pupils.

Research Question Four

How effective are school feeding programs in improving learners' cognitive abilities?

Table 4: The Effectiveness of School Feeding Programs in Improving Learners' Cognitive Abilities

Statement	Mean	Standard deviation	Remark
A school feeding programme is currently running in my school.	1.88	0.81	Disagree
The school feeding programme improves learners' attention and concentration.	2.39	0.84	Disagree
The school feeding programme improves learners' memory and recall ability.	2.47	0.83	Disagree
The school feeding programme improves learners' participation in classroom activities	2.62	0.92	Agree

Grand mean	**2.34**	**0.85**

Source: Field survey, 2025.

According to Table 4, respondents' opinions indicate that while some schools may have feeding initiatives, their overall impact on attention, memory, and classroom participation remains limited. The grand mean of 2.34 shows a relatively low level of agreement regarding the effectiveness of these programs. This suggests that school feeding programs are not widely implemented or are only marginally effective in enhancing learners' cognitive abilities.

Research Question Five

What role does parental nutrition knowledge play in children's cognitive development?

Table 5: The Role of Parental Nutrition Knowledge in Children's Cognitive Development

Statement	Mean	Standard deviation	Remark
The parents of the children demonstrate good knowledge of healthy nutrition for children.	2.98	0.66	Agree
Parental nutrition knowledge influences the type of meals their children bring or eat at school.	3.41	0.63	Agree
Children whose parents have good nutrition knowledge are more attentive in class.	3.04	0.79	Agree
Parental nutrition knowledge is important for children's cognitive development.	3.29	0.68	Agree
Grand mean	**3.18**	**0.69**	

Source: Field survey, 2025.

As shown in Table 5, the data reveal that parental nutrition knowledge plays an important role in shaping children's cognitive outcomes. Respondents agreed that parents who understand the principles of healthy nutrition are more likely to provide balanced meals

that promote attentiveness and cognitive efficiency in their children. The grand mean of 3.18 indicates a moderate agreement that parental awareness directly influences both the type of meals children consume and their overall academic and cognitive performance.

Discussion of Findings

This section presents the interpretation of the results obtained from the data analysis in relation to the research questions and existing literature. The findings are discussed based on the major objectives of the study.

From research question one, impact of nutrition on the cognitive development of pre-school children. The findings in Table 1 shows that most persons agreed that eating regular breakfast and having balanced meals helps young children think and learn better. The grand mean of 3.56 shows that nutrition has a strong effect on how children's brains work. This means that good eating habits are very important for helping preschool children grow mentally and get ready for school learning. This agrees with Grantham-McGregor et al. (2007), who found that well-nourished children show better attention, memory, and learning ability than those who are malnourished. They explained that proper nutrition supports early brain development and helps children perform better in school.

The second research question, to what extent do the types of food children eat and malnutrition affect their academic performance. The findings in table two shows that poor nutrition, meal skipping, and unhealthy eating habits negatively affect children's concentration and learning ability. On the other hand, well-fed children tend to have better memory, focus, and academic performance. The grand mean of 3.31 indicates that participants agreed that the types of food children eat and their nutritional status significantly influence their academic performance. This means that the type of food children eat and their overall nutritional status play an important role in how well they perform in school. Adewumi and Olayemi (2020) found that children who eat balanced and adequate meals perform better

in school because good nutrition improves their concentration, energy, and ability to understand lessons. They also noted that poor eating habits and malnutrition lead to tiredness, low attention span, and poor academic results among pupils.

From the third research question, if there's difference in cognitive development between well-nourished and undernourished pupils. The findings suggest that children who eat balanced and adequate meals tend to pay more attention, participate better, and stay more focused in class than those who do not eat well. This means that good nutrition helps improve children's thinking and learning ability. The grand mean of 3.17 shows that most people agreed that there is a clear difference in brain development between well-fed and undernourished pupils. Onyango et al. (2019) reported that children with poor nutritional status performed worse in school and had lower attention and participation levels compared to well-nourished pupils, showing that good nutrition supports better learning outcomes.

The fourth research question, the analysis of Table 4 shows that although some schools have feeding programmes, their impact on pupils' attention, memory, and classroom participation is still limited. The grand mean of 2.34 suggests that these programmes are not very effective and not properly implemented in many schools. This means that while school meals can help improve children's focus and energy for learning, the benefits are not fully realized when the programmes are irregular or poorly managed. Aurino et al. (2018) found that school feeding programmes had a positive impact on children's learning and participation, especially in low-income and conflict-affected areas. However, they also noted that the effectiveness depends on how well the programmes are managed.

Lastly, the fifth research question on the role of parents nutritional knowledge in children's cognitive development. Respondents agreed that parents who understand the principles of healthy nutrition are more likely to provide balanced meals that promote attentiveness and cognitive efficiency in their children. The grand mean of 3.18 indicates a

moderate agreement that parental awareness directly influences both the type of meals children consume and their overall academic and cognitive performance. When parents know about good nutrition, their children eat better and think better. Zarnowiecki et al. (2012) in his study looked at how much parents know about healthy food and how that affects what their young children know and eat. The researchers found that when parents understand nutrition, their children also learn healthy habits and eat better which helps with growth and brain function. But when parents don't know much about nutrition, children may eat poorly, get weak, and find it hard to pay attention or learn. Ogunba, (2010) in his study examined how mothers' knowledge of child feeding affects what children eat. It found that children whose mothers had good nutrition knowledge ate more balanced meals and were less likely to be malnourished, improving their mental alertness and school performance.

In conclusion, good nutrition improves children's thinking, memory, and learning, while poor feeding habits reduce performance. School meals help but are often poorly managed, and parents' nutrition knowledge also affects children's growth and learning.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary

This study was designed to investigate the impact of nutrition on the cognitive development of young learners in Oredo Local Government Area of Edo State. A descriptive survey research design was adopted for this study, five research questions were raised and data were collected using a structured questionnaire titled "**The Impact of Nutrition on the Cognitive Development of Young Learners**" a sample size of eighty respondents was randomly selected from ten schools which include five public and five private schools. The data were analyzed using mean and standard deviation methods.

The findings shows that;

1. Good nutrition helps children focus better and learn faster. It supports their brain growth and learning ability. The grand mean of 3.56 shows that nutrition strongly supports the child's brain development and learning process. They are more focused, easily remember things, and perform better.

2. Children who eat well are more attentive, focused, and perform better in school, while poor nutrition and meal skipping reduce their ability to concentrate and learn effectively.
3. Well-nourished children demonstrate better cognitive functioning, meaning they can think more clearly, solve problems faster, and remember information more effectively. The grand mean of 3.17 reflects moderate agreement that there are observable differences in cognitive development between well-nourished and undernourished pupils. Undernourished children often face several learning challenges. Because they don't get enough of the right nutrients, they may feel tired, weak, or less focused during class. This makes it harder for them to pay attention, understand lessons, and take part in school activities.
4. School feeding programmes can help pupils stay alert and learn better, but in many schools, they have little effect because they are poorly planned or managed and not carried out regularly.
5. Parents who know about good nutrition give their children better meals that help them think, focus, and learn well. When parents lack this knowledge, kids may eat poorly, get tired easily, and struggle in school. So, what parents know about food greatly affects how their children grow and learn.

Conclusion

From the findings of this study, it could be concluded that nutrition plays a critical role in the cognitive development and academic performance of preschool children. Well-nourished children who eat balanced meals and have regular meals demonstrate better attention, memory, participation, and overall learning ability compared to undernourished children. Poor nutrition, unhealthy eating habits, and meal skipping negatively affect children's focus, energy, and school performance.

Although school feeding programmes have the potential to improve children's learning, their impact is limited when not well-managed or consistently implemented. Furthermore, parental knowledge about healthy nutrition significantly influences the types of meals children consume, which in turn affects their cognitive growth and academic outcomes. Overall, proper nutrition supported by informed parents and effective school programmes is essential for fostering the mental and academic development of preschool children.

Recommendations

Based on the findings and conclusion of this study, the following recommendations were made.

1. Educate Parents on Nutrition: Parents should be equipped with knowledge on providing balanced and consistent meals to support their children's cognitive development and academic performance through well-structured seminar and workshops.
2. Implement and Support Comprehensive School Feeding Programmes: All schools, with the backing of government and relevant policy frameworks, should provide well-structured, consistent, and nutritious meals. This ensures that every child, particularly those from low-income backgrounds, receives the essential energy and nutrients required to enhance concentration, cognitive development, and overall academic performance.
3. Promote Healthy Eating Habits in Schools: Schools should integrate nutrition education and actively encourage children to make healthy food choices.
4. Monitor and Support Undernourished Children: Teachers and school health personnel should track children's nutritional status and provide targeted support to those who are undernourished.

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Institute of Education

University of Benin

Benin City.

Dear Respondent,

REQUEST FOR YOUR CO-OPERATION IN COMPLETING THIS QUESTIONNAIRE

I am an undergraduate student of the University of Benin, Institute of Education. I am conducting a research on the topic "**THE IMPACT OF NUTRITION ON THE COGNITIVE DEVELOPMENT OF YOUNG LEARNERS**". You have been randomly selected as one of the respondent to answer the questions. I hereby solicit your honest response in filling out the questionnaire and assure you that all information will be treated with utmost confidence.

Thanks for your anticipated cooperation.

Yours faithfully,

Charity Eseosa Egharevba

(Researcher)

QUESTIONNAIRE

SECTION A

Type of School: Public ( ) Private ( )
Gender: Male ( ) Female ( )
Educational Qualification: NCE( ) OND( ) HND( ) BSC/BED ( )PGDE ( )
Years of Experience: Below ten years ( ) above ten years ( )

SECTION B

Instruction: Please tick (√) the preferably option
Strongly Agree (SA) Agree (A) Disagree (D) Strongly Disagree (SD)

S/N		**SA**	**A**	**D**	**SD**
1	Regular breakfast improves young learner's attention and focus in class.				
2	Balanced meals (fruits, vegetables, proteins, grains) improve young learner's memory and recall.				
3	Good nutrition improves problem-solving and reasoning skills in young learners.				
4	Good nutrition improves classroom participation and task completion				
5	The types of food children eat affect their academic performance				
6	Malnutrition affects children's concentration and alertness in school.				
7	Skipping meals reduces children's ability to learn effectively.				
8	Well-nourished pupils have better memory and recall ability than under-nourished pupils.				
9	Poor diet reduces children's participation in school activities.				
10	Well-nourished pupils show better attention and focus than under-nourished pupils.				

11	Well-nourished pupils participate more in class than under-nourished pupils.				
12	Nutritional status explains differences in overall cognitive development between pupils.				
13	A school feeding programme is currently running in my school.				
14	The school feeding programme improves learners' attention and concentration.				
15	The school feeding programme improves learners' memory and recall ability.				
16	The school feeding programme improves learners' participation in classroom activities				
17	Parents of the children show good knowledge of healthy nutrition for children.				
18	Parental nutrition knowledge influences the type of meals their children bring or eat at school.				
19	Children whose parents have good nutrition knowledge are more attentive in class.				
20	Parental nutrition knowledge is important for children's cognitive development.				