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The effect of nutrition and Pupils' academic performance: A case study of selected Primary schools in Muhororo Sub County, Kagadi district, Uganda.

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ABSTRACT

This study was carried out to examine the effects of nutrition on pupils' performance in selected primary schools in Muhororo Sub County, Kagadi District. The study objectives were; to establish the effects of nutrition on the academic performance of pupils in selected primary schools in Muhororo Sub County, Kagadi district, to find out the relationships between nutrition and brain function of pupils in selected primary schools in Muhororo Sub County, Kagadi district and to suggest measures that can be taken to solve the problem of poor nutrition in primary schools. A cross sectional survey design using both quantitative and qualitative methods were used to collect data. The qualitative study design investigated the effects of nutrition on pupils' performance between the independent and the dependent variables. The sample was drawn from selected primary schools in Muhororo Sub County, Kagadi District. Data on nutrition and academic performances were gathered using a questionnaire. Structured interview guides were used to collect views from the non-pupils. Data from questionnaires were analyzed using both descriptive and inferential statistics and interviewed data was analyzed using frequency analysis by counting the number of times of responses had by the respondents. From the study, conclusions were drawn and recommendations as well.

Keywords; Nutrition, pupils, academic, performance, primary school, Muhororo, county, Kagadi and District.

INTRODUCTION

Good academic performance is important for elementary age children as a tool for successful life as an adult. Proper nutrition for our children is a construction in which the individual as an indivisible being attains a positive state of integration of mind, body, and spirit with the environmental contexts. Academic achievement for children occurs within the construct of proper nutrition, living condition of parents and parents support to their children, as there is mutual influence between academic factors and non-academic factors for a child, [1]. The influence of the

Department of Education emphasizes clearly the importance of providing good education to every child in the community, hence the department introduced the National Achievement Test (NAT) to spell out the community's values and perception of what Education in the community should be. Amongst the plethora of possible solutions, perhaps they should look first at the nutritional substance of what our school-aged children are eating each day as they struggle through a day of learning. There is a correlation between nutrition and cognition as well as psychosocial behavior; this relationship has been highly under-researched, but there exists many studies that look at the nutritional benefits of many proteins, vitamins, and food substances as they affect learning and brain function. Our schools have the potential to play a vital role in preparing and sustaining our pupils' potential learning abilities and benefitting their social behaviors by supplying nutritious breakfasts and lunches during school days.

Recent studies have demonstrated that nutrition affects Pupils' thinking skills, behavior, and health, among all factors that impact academic performance. Research suggests that diets high in Trans and saturated fats can negatively impact learning and memory, nutritional deficiencies early in life can affect the cognitive development of school-aged children, and access to nutrition improves pupils' cognition, concentration, and energy levels. For example, one study found that Pupils with less nutritious diets performed worse on a standardized literary assessment [2]. Another study discovered that Pupils who ate more fast food fared worse on math and reading scores [3]. Similarly, a study that analyzed a healthy eating campaign that banned junk food from schools and introduced healthier, freshly prepared school meals found that participating Pupils scored higher on English and science tests than Pupils who did not take part in the campaign [4].

Nutrition also indirectly impacts school performance. Poor nutrition can leave Pupils' susceptible to illness or lead to headaches and stomachaches, resulting in school absences [5]. Access to nutrition that incorporates protein, carbohydrates, and glucose has been shown to improve Pupils' cognition, concentration, and energy levels [6-7]. In contrast, nutritional deficiencies (particularly zinc, B vitamins, Omega-3 fatty acids, and protein) early in life can affect the cognitive development of school-aged children [7]. Studies also suggest that diets high in trans and saturated fats can negatively impact the brain, influencing learning and memory [8]. Finally, research has also established a link between nutrition and behavior. Studies have found that access to nutrition, particularly breakfast, can enhance a Pupil's psychosocial well-being, reduce aggression and school suspensions, and decrease discipline problems [5]. Providing the nation's low-income youth with nutritious food has been a concern for over a hundred years. To see that food insufficient Pupils were adequately fed, school lunch programs began during the Great Depression of the 1930's. From the beginning the program had two goals: to make use of surplus agricultural commodities owned by the government as a result of price-support agreement with the farmers and to help prevent nutritional deficiencies among low-income school children by feeding them nutritious meals.

Aim of the Study

The aim of this study is to examine the effects of nutrition on pupils' performance in selected primary schools in Muhororo Sub County, Kagadi District.

Objectives of the Study

i. To establish the effects of nutrition on the academic performance of pupils in selected primary schools in Muhororo Sub County, Kagadi district.
ii. To find out the relationships between nutrition and brain function of pupils in the selected primary schools in Muhororo Sub County, Kagadi district.
iii. To suggest measures that can be taken to solve the problem of poor nutrition in primary schools.

Research Questions

i. What are the effects of nutrition on the academic performance of pupils in selected primary schools in Muhororo Sub County, Kagadi district?
ii. Is there any relationship between nutrition and brain function of pupils?
iii. What are the measures that can be taken to solve the problem of poor nutrition in primary schools?

Scope of the Study

The study was carried out in 6 primary schools found in in Muhororo Sub County, Kagadi district bordering Kyenjojo in west, Kibaale in East Hoima in south. The schools include Nyambeho, Kasoga Model, Kabuga, St. Paul,

Victoriuos and Kyanyarare primary schools. Data was collected in these schools. The study was focused on finding out the effects of nutrition on the academic performance of pupils in selected primary schools in Muhororo Sub County, Kagadi district.

METHODOLOGY

Research design

In this study a cross sectional survey design was used. Both quantitative and qualitative methods were be used to collect data from selected schools which formed a representative sample. [9] argues that this design helps to gather opinions from a cross section of the population.The design was used to obtain information about preference, attitudes, practices, concerns and opinions about pupils' living conditions and how they affect their academic performance. This is because this design is appropriate to investigate the effect of living conditions on pupils' academic performance in Muhororo Sub County, Kagadi district. This method was used because it produces normative data required for quantitative analyses [10].

Study Area

The study was carried out in in Muhororo Sub County situated in Kagadi district. The study focused mainly on 6 selected primary schools in the above sub county, teachers and head teachers to critically analyze the effect of nutrition in a school on pupils' academic performance.

Study Population

A total population of 1153 people were considered as the target population for this study. [11] Define the term population as the group of individuals, objects or items from which samples are taken for measurements. The population for this study include head teachers, deputy head teachers, Pupils and some parents.

S/N	Category of respondents	Population size	Sample size	Sampling method
1	Head teachers	4	4	Purposive sampling
2	Teachers	40	4	Purposive sampling
3	Pupils	1000	276	Simple random sampling
4	Parents	101	32	Purposive sampling
5	Deputy head teachers	4	4	Purposive sampling
	Total	1153	320	

Source: [12]

Sample size and sampling procedure

The sample size comprised of 320 respondents based on [12]. The respondents which were selected were from 6 selected schools which were considered in the study. The researcher selected objectively from the targeted population so as to tap correct data from the right individual. In sample size determination the formula by [13] was used:

$$n = \frac{Z^2PQ}{D^2}$$

Where n= desired sample size.
Z=Standard normal deviation taken at 1.96 at confidence level of 95%.
P= Proportion of targeted population estimated to have similar characteristics.
If there is no measurable estimate, 50% (constant) or 0.5 is used, therefore, P = 0.5
Q= Standardize 1.0-P=0.5
D= Degree of accuracy desired using 10%, or 0.1
In this case, 95% confidence level has 5% error.
The researcher set and took formalized questions to the respondents and get the needed data through questionnaires as well as face to face interaction with respondents.

Sampling techniques

Simple random sampling method so that each member of the population would get equal chances of being selected.

Purposive sampling. To select the targeted respondents who were school administrators and Board of governors from the selected schools. Stratified random sampling in which the population was divided into further number of strata and the sample was drawn from each stratum. The researcher adopted the above techniques because they are reliable, highly representative and present general view of the results [14].

Data sources

The researcher used both primary and secondary data sources. In primary sources of data, the researcher got firsthand information by asking the respondents during data collection by use of a questionnaire and interview guide while secondary data sources included information already researched on like magazines, newspapers and text books concerning the needed data. The researcher also used observation method to discover the opinions, feelings, views of the respondents in the area of the study so as to acquire real data needed for the study.

Research instruments

Questionnaire

A pre-tested questionnaire with both open and close ended questions were designed and administered to the selected respondents. Those who were able to read and write were allowed to fill their responses in the questionnaire themselves, while those who were not be able to read and write were helped by the researcher himself to explain and interpret the questionnaire.

Interviews

The researcher also used an interview guide to some key respondents like school administrators, so as to collect valid data from the right source.

Validity of instruments

In order to establish, the validity of instruments, the research is to employ a technique known as triangulation to examine how data collected answer the questions under study from different perspectives. This involved comparing responses from interviews and data collection through focus group discussions and documentary source. Triangulation does not only provide stronger information but also reveals discrepancies that single technique might not reveal. The researcher is to pilot the questionnaire before finally administering it's so as to test its validity that is the extent to which actually measures what is intended to measure in terms of content rather than measuring something else. The questionnaires are to be given expects to test them before use. The content of the validity of the questionnaire was determined by giving the questionnaires to two independent experts. The content validity index (CVI) was computed and the results showed 0.7 which supported their findings.

$$CVI = \frac{N}{n}$$

Where N = number of relevant items in the instruments
n = total number of items in the instruments

Reliability of instruments

An instrument is reliable if it consistently measures what is supposed to measure as observed by Walter (1989). It was established through repeated trials or administration of the instruments. According to Hessler (1992), with the test – retest method, the drawn conclusions are deemed dependable and results as verified. The researcher therefore used a test – retest method to establish reliability.

Data collection procedure

The researcher asked permission to carry out the study and presented the introductory letter from the university. Respondents were briefed by researchers about the purpose and objectives of the study. Furthermore respondents were informed that the study was for their own good and Muhororo Sub County At Large.

The questionnaires to the school administrators and teachers were distributed to them by the researcher and they were asked to complete them during their free time. The researcher personally interviewed the school head teacher of each school. He also requested for the files containing relevant information for the study. The researcher collected the completed questionnaires personally on the agreed dates.

Data analysis

The filled in questionnaires were checked for validity, clarity using pretest questionnaire before leaving data collection site. Data was edited, entered, coded, and analyzed correctly in the computer using SPSS and data analysis tools. The questionnaires was kept properly so that it will be used to describe basic statistics collected during the study after analysis by experts.

Data Presentation Analysis, and Interpretations

The researcher investigated the sex distribution of the respondents in the selected Primary schools in Muhororo Sub County, Kagadi District and the following findings were obtained;

Table 1: Sex respondents

Sex	Frequency	Percentage
Male	198	61.6
Female	122	38.4
Total	**320**	**100**

Source: Field data June 2017.

Table 1, the researcher found out that 198 respondents accounting for 61.6% were male, while 122 accounting for 38.4% were female and this meant that majority of the respondents who were involved in the study were male respondents. The researcher investigated on the marital status of the respondents and the following findings were obtained;

Table 2: Marital status of the respondents;

Marital status	Frequency	Percentage
Single	116	36.7
Married	182	56.6
Divorced	22	6.7
Total	**320**	**100**

Source: Field data June 2017

Table 2, the researcher found out that 116 respondents accounting for 36.7% were single, 182 accounting for 56.6% were married, and 22 accounting for 6.7% were divorced. This meant that majority of the respondents were married. The researcher also investigated about the age distribution of the respondents and the following findings were obtained;

Table 3: Age distributions of the respondents

Age	Frequency	Percentage
10-20	112	35
21– 30	154	48.4
31 – 40	27	8.3
41+	27	8.3
Total	**320**	**100**

Source: Field data June 2017

In table 3, above, the researcher found out that 112 respondents accounting for 35% were in the age bracket between 10-20, 154 respondents accounting for 48.4% were in the age bracket between 21–30, 27 respondents accounting for 8.3% were in the age bracket between 31– 40 and 27 respondents were above the age of 41accounting to 8.3%. This meant that most of the respondents were in the age bracket between 21-30 years which shows that most of the respondents were mature enough to give appropriate information. Effects of nutrition on the academic performance of pupils in selected primary schools in Muhororo Sub County, Kagadi district.

Table 4: Effects of nutrition on the academic performance

Effects of nutrition on the academic performance	Frequency	Percentage
Normal physiological and neurological growth and development	96	30
Support brain function and neurotransmitter activity	59	18.3
Eliminate or reduce stomach pain, headache, muscle tension, and fatigue,	54	16.7
Normal physiological and neurological growth and development	49	15
Nutritional deficiencies	11	3.4
Affect the cognitive development of school-aged children	28	8.4
Negatively impact the brain, influencing learning and memory	22	6.7
Total	**320**	**100**

Source: Field data June 2017

It was revealed that 96 accounting for 30% supported Normal physiological and neurological growth and development, 59 respondents accounting for 18.3% supported that nutrition support brain function and neurotransmitter activity, 54 accounting for 16.7% supported that good nutrition eliminates or reduces stomach pain, headache, muscle tension, and fatigue, 49 accounting for 15% supported normal physiological and neurological growth and development, 11 respondents accounting for 3.4% supported nutritional deficiencies, 28 accounting for 8.4% supported affect the cognitive development of school-aged children while 22 accounting for 6.7% supported negatively impact the brain, influencing learning and memory. The factors presented here are not however exhaustive and therefore are not conclusive to be the only effects of nutrition on the academic performance of pupils. There might be other factors that may interfere. All the selected respondents participated and this shows that the above effects are true according to the support of the respondents. The relationships between nutrition and brain function of pupils in selected primary schools in Muhororo Sub County, Kagadi district.

Table 5: Relationships between nutrition and brain function of pupils

Relationships between nutrition and brain function of pupils	Frequency	Percentage
Affecting cognitive functioning	106	33.3
Relationship on concentration	58	18.3
Iron plays an important role in brain function	70	21.7
Zinc is another nutrient that plays a role with cognition, specifically with memory.	48	15
Food consumption is vital to the brain being able to make the right amount of amino acids and choline.	10	3.4
The substances, all found in food, are important to brain development and function.	26	8.4
Lack of protein, also known as Protein Energy Malnutrition, lead to poor school performance by children	21	6.7
Total	**320**	**100**

Source: Field data June 2017

The study revealed that 106 accounting for 33.3% supported that nutrition affects cognitive functioning, 58 respondents accounting for 18.3% supported there is a relationship on concentration brought by nutrition with

pupils, 70 respondents accounting for 21.7% supported that Iron plays an important role in brain function, 48 accounting for 15% supported Zinc is another nutrient that plays a role with cognition, specifically with memory, 10 accounting 3.4% supported food consumption is vital to the brain being able to make the right amount of amino acids and choline, 26 respondents accounting for 8.4% supported the substances, all found in food, are important to brain development and function 21 respondents accounting for 6.7% supported lack of protein, also known as Protein Energy Malnutrition, lead to poor school performance by children. According to the above findings, it is therefore shown that there is a great relationship between nutrition and brain function of pupils in selected primary schools in Muhororo Sub County, Kagadi district. Measures that can be taken to solve the problem of poor nutrition in primary schools.

Table 6: Measures that can be taken to solve the problem of poor nutrition

Measures that can be taken to solve the problem of poor nutrition	Frequency	Percentage
Pupils should be provided with balanced diet foods.	106	33.3
Should always get their food in time to avoid stomach pains and the related diseases	58	18.3
government sensitization	70	21.7
A program that provided breakfast to primary school significantly increases arithmetic scores	48	15
Government should provide help to the families which are needy so as to cater for good food for their children for their good performance in studies	10	3.4
Pupils should always be reminded to eat their meal in time while at home and school.	26	8.4
Pupils should be sent to schools with packed foods	21	6.7
Total	**320**	**100**

Source: Field data June 2017

The study revealed that 106 accounting for 33.3% supported that Pupils should be provided with balanced diet foods, 58 respondents accounting for 18.3% supported that Should always get their food in time to avoid stomach pains and the related diseases, 70 respondents accounting for 21.7% supported that government should put sensitization programs about nutrition, 48 accounting for 15% supported that a program that provided breakfast to primary school children increases arithmetic scores, 10 accounting 3.4% supported Government should provide help to the families which are needy so as to cater for good food for their children for their good performance in studies, 26 respondents accounting for 8.4% supported Pupils should always be reminded to eat their meal in time while at home and school, 21 respondents accounting for 6.7% supported Pupils should be sent to schools with packed foods. According to the above findings, it is therefore shown that measures that can be taken to solve the problem of poor nutrition in primary schools are above though there are other, in selected primary schools in Muhororo Sub County, Kagadi district.

CONCLUSION

This research hereby concluded that;

1. The academic performance of the Pupils due to malnutrition in the school is low.
2. It was noted that the teachers agreed, and were encouraged to sensitize and encourage their pupils in taking good nutrition in time, this will help them improve academically. Many parents were willing to help their children improve their academic work though the provision of necessary nutrition good for their health.
3. Many school children were found to be lacking essential facilities such as text books, playground at homes which made learning difficult and more abstract.
4. Children covered long distance to and from school.
5. They carried chores at home in the morning and evenings thus they arrived school tired and could no' carry out their academic work to the expectation as suggested by (Bellisle, 2004; Sorhaindo & Feinstein, 2006).

RECOMMENDATIONS

1. The parents/guardians in Muhororo Sub County, Kagadi District should ensure that their children do not miss their meals and should take it in time.
2. Parents/guardians in in Muhororo Sub County, Kagadi District should always have positive response towards their children's work and should find the well balanced food that will help their children to excel.
3. Parents/guardians should be willing to provide resources necessary for their children's academic work to equip the school children with necessary skills and knowledge relevant to their level.
4. The school administration should also include health education on the school time table and also organize healthy talks to pupils.5.
5. Finally, the Ministry of Education and Sports through the supervision unit, should ensure that all schools in rural areas follow the guidelines on proper accommodation.

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