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EDUCATION

INFLUENCE OF NUTRITION ON QUALITY OF PRE-PRIMARY IN TURKANA CENTRAL SUB-COUNTY, TURKANA COUNTY, KENYA

Joyce Chebet[1*], Dr. Hannah Kangara[2] & Dr. Wanjohi Githinji[3]

[1*]Mount Kenya University, Kenya; Email: joycmax63@gmail.com; ORCID ID: https://orcid.org/0000-0003-3594-7096

[2]Chuka University, Kenya; Email: hkangara@chuka.ac.ke, hannahkangara@gmail.com,; ORCID ID: https://orcid.org/0000-0001-8453-7064

[3]Kenyatta University, Kenya; Email: wanjohi.githinji@ku.ac.ke; ORCID ID: https://orcid.org/0000-0001-8665-8855

ABSTRACT

Statement of the Problem: Nurturing care plays an important role in enhancing the quality of pre-primary school education. However, in Turkana Central Sub-county, the quality of pre-primary school education is a challenge. Many pre-primary school learners manifest low basic numeracy, language and creativity skills.

Purpose: This study assessed the influence of nutrition on the quality of pre-primary school education in Turkana Central Sub-county, Turkana County, Kenya. The study was guided by the motivational theory and theory of all-round educational quality.

Methodology: A mixed methodology was applied and the concurrent triangulation design. Data analysis began by identifying common themes from the respondents' descriptions of their experiences. Qualitative data were analyzed thematically along the objectives and presented in narrative forms. Quantitative data were analyzed descriptively using frequencies and percentages and inferentially using Pearson's Product Moment Correlation Analysis with the use of Statistical Packages for Social Science (SPSS Version 23) and presented using tables.

Findings: The study established that nutrition practices and provision of opportunities for early education improve the quality of education.

Unique Contribution to Theory, Policy and Practice: Thus, the study recommends that the government should partner with stakeholders in pre-primary school education and other donors to provide resources such that there is a guarantee of supply of food ration to learners.

Keywords: *Nutrition, Quality of Pre-Primary Education.*

1.1 INTRODUCTION

Nutrition entails the provision of balanced diets to children. The nutrition practices adopted by parents and key caregivers are another important influence on dietary intake. Many parenting practices related to children and eating have evolved from a parental perception of environmental threats to their children's wellbeing and often pass from generation to generation. Some 'traditional' practices developed in a time of food scarcity (Savage, Fisher & Birch, 2017), whereas food for most New Zealanders is now relatively plentiful and current threats to wellbeing involve the abundance of energy-rich, nutrient-poor foods and the increasing risk of obesity.

In a study carried out in Nepal among 112 respondents about childhood malnutrition and cognition, Moorck and Leslie (2014) indicate that, in an educational world filled with failing schools and apathetic learners, school committees on education have searched for solutions on how to increase test scores and create school systems where all learners receive the best education possible. Among the plethora of possible solutions have included a look at the nutritional substance of what school-aged children are eating each day as they struggle through a day of learning. According to Del Rosso (2013), there is a correlation between nutrition and learners' cognitive development, health as well as school attendance which immensely contribute to the academic achievement of pre-primary school learners. However, this relationship has been highly under-researched, though there exist many studies that look at the nutritional benefits of many proteins, vitamins, and food substances as they affect learning and brain function. Pre-primary schools have the potential to play a vital role in preparing and sustaining learners' potential learning abilities and benefitting their social behaviors by supplying nutritious mid-morning meals and lunches during school days.

According to Ahmed and Ninno (2015), children affected by hunger and malnutrition as well as ill-health do not have the same potential to do well at school in comparison with well-nourished and healthy children. Poor health and malnutrition lower children's cognitive development and performance through physiological changes or reduced capacity to participate in learning activities. In New Zealand, for example, one-fifth of children leave for school without balanced dietary provisions and is more common among older children, girls, Maori and Pacific children, and those living in lower socio-economically resourced areas (Grantham, 2015). In Sub-Saharan Africa, poor nutrition has been associated with adverse effects on cognitive function including memory, academic performance, school attendance, psychosocial

function and mood in children and young people. Conversely, a study carried out in Morocco by Grantham (2015) found that proper nutrition is associated with a range of positive outcomes, including better school attendance, academic performance, nutrient intake, fitness, and healthier body weight. In Kenya, following the initiation of school feeding programmes, nutritious breakfast provides 16% of children's daily energy intake, around one-third of calcium, iron, thiamine, riboflavin and folate intakes, and one-fifth of zinc intake (Hoyland, 2018). Children who miss such morning dietary provisions have significantly worse daily nutrient intakes, including higher intakes of total fat, and lower intakes of dietary fiber and micronutrients than those who eat nutritious breakfast. However, some parents and caregivers still use 'clear your plate' messages concerning their own and their children's eating. Putting pressure on children to eat healthy foods and to eat more, in general, can be counterproductive.

In Turkana Central Sub-county, young children depend on their families and teachers to support their well-being and promote positive development, including eating behaviors. Children's food preferences and willingness to try new foods are influenced by parental practices (Ministry of Education, 2019). The eating behaviors children practice early in life affect their health and nutrition and continue to shape food attitudes and eating patterns through adulthood. A report by the Ministry of Education (2019) noted that eating environments, mealtime and snack that make food fun, offer new foods and a variety and encourage children to taste and choose the foods they want to let children develop food attitudes and dietary practices that ultimately support good health. MoE (2019) asserts that such nutrition practices enhance the quality of pre-primary school education among pre-primary school learners. However, this has been the case in many pre-primary schools in Turkana Central Sub-county where many pre-primary school learners manifest low grades in basic numeracy, language and creativity skills as shown in Table 1.

Table 1: Annual Assessment Results of Learners in Public Pre-primary Schools from 2014-2018

Year of Assessment	Annual Assessment Results in Basic Numeracy, Language and Creativity Skills		
	Basic Numeracy Skills	Language Skills	Creativity Skills
2014	5.1	3.1	6.9
2015	4.9	2.7	6.2
2016	3.7	2.3	4.7
2017	3.1	2.1	3.4
2018	2.6	1.9	3.0

Source: MoE (2019)

Table 1 paints a picture of the declining quality of pre-primary education in public pre-primary schools. It was against this background that the researcher sought to assess the influence of nutrition on the quality of pre-primary school education in Turkana Central Sub-county in Turkana County, Kenya.

1.2 STATEMENT OF THE PROBLEM

Nutrition plays an important role in enhancing the quality of pre-primary school education. However, in many pre-primary schools in Turkana Central Sub-county, the quality of pre-primary school education of learners has been a challenge. Many pre-primary school learners manifest poorly developed basic numeracy, language and creativity skills. As indicated in Table 1, a report by the Ministry of Education (2019) indicates that only 23.9% of pre-primary school learners have competency in mathematics skills, have a well-developed communicative competency in reading, writing and oral skills whereas only 22.6% manifest creativity skills such as drawing, shape formation and coloring among others. Efforts to mitigate these challenges such as employment of pre-primary school teachers and provision of curriculum support materials have not registered remarkable improvement. Despite these observations, much is yet to be done to establish the extent to which nutrition practices adopted in schools influence the quality of pre-primary school education. In other words, few empirical studies have interrogated how parents' discipline, homework, nutrition and role modeling practices influence the quality of pre-primary school education; hence, the study.

1.3 OBJECTIVES OF THE STUDY

The study sought to address the following objectives;

1. To assess the quality of pre-primary school education in public secondary schools in Turkana Central Sub-county;
2. To establish the influence of nutrition on the quality of pre-primary education in Turkana Central Sub-county

2.1 THEORETICAL FRAMEWORK

This study was based on motivational theory which was postulated by Abraham Maslow in 1943. This theory suggests five interdependent levels of basic human needs (motivators) that must be satisfied in a strict sequence starting with the lowest level. This theory applies to the current study because if parents' basic needs have not been met, then they will not have time to involve themselves in their pre-school children's education. For example, when the

physiological needs such as the needs for food, water and shelter have not been met, then parents might spend more time trying to meet these needs and they may not be motivated to get involved in their preschool children's education. This theory was appropriate for this study in that it guides parents and the school system to meet children's needs so that these children may be more likely to learn effectively. This study was also guided by the Theory of all-round educational quality which was postulated by Xiangyang (2009). This theory holds that all-round quality education is the application of all-round quality management in the area of education. Xiangyang (2009) asserts that, as the continued expansion on the concept of education quality, the quality of education is not only to train learners to possess knowledge, but also to help them have other various qualities such as working attitude, sense of cooperation and competition, professionalism, moral cultivation, environmental adaptability and mental endurance capabilities. In the context of this study, all-round quality management is applied in the field of pre-primary school education since it emphasizes education as a service that is provided to meet learners' and their parents' needs, who are considered to be "consumers" and "customers". This theory underscores the fact that twin functions of schools are; the function in the quality of personnel training which is the most fundamental. The theory functions of pre-primary school education indicate that there are varieties of quality standards in the quality of pre-primary school education.

3.1 RESEARCH METHODOLOGY

A mixed methodology was applied and the concurrent triangulation design. The target population consisted of 35 headteachers, 153 pre-primary school teachers, 490 parents' representatives and 606 learners totaling 1284 from which a sample of 305 respondents was determined using the Yamane's Formula. Stratified sampling was used to create five different strata based on the number of zones in Turkana Central Sub-county. For each zone, two headteachers, two parents' representatives and 22 pre-primary school teachers were selected using purposive sampling. However, from each zone, 35 pre-primary school learners were selected using simple random sampling. This procedure realized a sample of 10 headteachers, 110 pre-primary school teachers, 10 parents' representatives and 175 pre-primary school learners. Questionnaires were used to collect data from pre-primary school teachers, whereas interviews were used to collect qualitative data from headteachers and parents' representatives. An observation checklist was used to collect data from learners. Data analysis began by identifying common themes. Qualitative data were analyzed thematically along the objectives and presented in narrative forms. Quantitative data were analyzed descriptively using

frequencies and percentages and inferentially using Pearson's Product Moment Correlation Analysis with the help of Statistical Packages for Social Science (SPSS Version 23) and presented using tables.

4.1 RESULTS AND DISCUSSIONS

This section presents the findings of the study based on the objective. It also outlines the methods of presentation of the study findings and discussions.

Response Rates

In this study, 110 questionnaires were administered to pre-primary school teachers, out of which 106 were successfully filled and returned. At the same time, the researcher also interviewed eight (8) headteachers and seven (7) parents' representatives. The researcher also undertook observation schedules among 143 pre-primary school learners. This yielded response rates shown in Table 2;

Table 2: Response Rate

Respondents	Sampled Respondents	Those Who Participated	Achieved Return Rate (%)
Headteachers	10	8	80.0
Pre-primary School Teachers	110	106	96.4
Parents' Representatives	10	7	70.0
Pre-primary School Learners	175	143	81.7
Total	**305**	**264**	**86.6**

Source: Field data (2021)

Table 2 shows that headteachers registered a response rate of 80.0%, pre-primary school teachers registered a response rate of 96.4%, parents' representatives registered a response rate of 70.0% whereas pre-primary school learners registered a response rate of 81.7%. This yielded an average response rate of 86.6% which affirmed the assertions of Creswell (2014) that any response rate above 75% is sufficient and of the acceptable levels to enable the generalization of the results to the target population.

Assessment of Quality of Pre-primary School Education

The first objective of the study sought to assess the levels of quality of pre-primary school education. This was measured by assessing the levels of syllabus coverage and pre-primary school learners' manifestation of basic numeracy, language and creativity skills. Descriptive data were collected from pre-primary school teachers and results are shown in Table 3.

Table 3: Levels of Quality of Pre-primary School Education

Indicators of Quality of Pre-primary School Education	Good %	Fair %	Below Average %
Syllabus coverage	63.2	30.2	6.6
Basic numeracy skills such as number recognition, ordering and basic operations	31.1	18.0	50.9
Language skills such as reading, writing and speaking	26.4	17.9	55.7
Creativity skills such as drawing, coloring, etching, painting and pattern formation	45.3	25.5	29.2

Source: Field Data (2021)

Table 3 shows that the majority, 67(63.2%) of the pre-primary school teachers indicated that their syllabus coverage is good, 32(30.2%) indicated fair whereas 7(6.6%) of the teachers indicated below average. However, 33(31.1%) of the pre-primary school teachers indicated that their learners manifest good basic numeracy skills such as number recognition, ordering and basic operations, 19(18.0%) indicated fair whereas slightly more than half, 54(50.9%) indicated below average. Table 3 also shows that 28(26.4%) of the pre-primary school teachers indicated that their learners manifest good language skills such as reading, writing and speaking, 19(17.9%) indicated fair whereas slightly more than half 59(55.7%) indicated that pre-primary school learners manifest language skills which are below average. Table 3 further shows that 48(45.3%) of the pre-primary school teachers indicated that their learners manifest good creativity skills such as drawing, coloring, etching, painting and pattern formation, 27(25.5%) indicated fair whereas 31(29.2%) indicated below average. These findings lend credence to a report by the Ministry of Education (2019) which indicated that, in many pre-primary schools in Turkana Central Sub-county, the quality of pre-primary school education of learners is low with many pre-primary school learners manifesting poorly developed basic numeracy, language and creativity skills.

According to MoE (2019), only 23.9% of pre-primary school learners have competency in mathematics skills, have a well-developed communicative competency in reading, writing and oral skills whereas only 22.6% manifest creativity skills such as drawing, shape formation and coloring among others. This implies that, despite the efforts by different stakeholders to improve the quality of pre-primary school education, many pre-primary school learners still register low grades in basic numeracy, language and creativity skills.

Thematic Analysis on the Status of Quality of Pre-primary School Education

During the interviews, the headteachers and parents' representatives disagreed with pre-primary school teachers that their syllabus coverage is good. They, however, noted that many pre-primary school teachers are slow in covering the syllabus. Headteacher, H1, observed:

> *In my pre-primary school, teachers rarely complete their syllabus in time. Sometimes, learners are rushed through the content just to cover the syllabus. This has hurt the quality of pre-primary school education*

Headteachers and parents' representatives, however, concurred with the pre-primary school teachers that learners manifest basic numeracy, language and creativity skills which are below average. Parents' Representative, PR1, noted:

> *My child cannot perform basic numeracy skills such as number recognition, ordering and basic operations. Besides, my child has poor communicative competencies, reading and speaking skills. However, he manifests good creativity skills such as drawing, coloring, etching, painting and pattern formation.*

The researcher also observed that many pre-primary school learners have challenges with solving basic number work tasks such as number recognition, counting and basic operations like addition and subtraction. The researcher observed;

> *The majority of the preprimary school learners recognize numbers from slabs, cannot add or subtract operations like 3 +9 or 8-3 with ease nor were they able to state the values of numbers.*

The researcher also observed that the ability of pre-primary school learners to communicate fluently is a real problem. That is, many pre-primary school learners could not read, write or sound specific words and even state the meanings of words. However, just as indicated by headteachers and pre-primary school teachers, many pre-primary school learners manifest good levels of creativity. They could colour shapes, form patterns, draw diagrams with ease and undertake crayon etching with little difficulty. As noted in quantitative findings, these views further point to the fact that dynamics within schools are key in enhancing syllabus coverage and pre-primary school learners' performance. Likewise, these views are indicative of the fact that pre-primary school learners still register low grades in basic numeracy and language and creativity skills, though their level of creativity and innovativeness is good.

Nutrition and Quality of Pre-primary School Education

The second objective of the study further sought to examine how nutrition influences the quality of pre-primary school education. Descriptive data collected from pre-primary school teachers were presented as shown in Table 4;

Table 4: Views of Pre-primary School Teachers on the Influence of Nutrition on Quality of Pre-primary School Education

Summary of Test Items	SA %	A %	U %	D %	SD %
The provision of supplements has enhanced the quality of pre-primary school education	58.8	21.6	4.1	10.4	5.1
Breastfeeding of children influences the quality of pre-primary school education	59.9	19.8	2.5	12.2	5.6
The provision of balanced diets is a determinant of the quality of pre-primary school education	65.9	13.4	3.7	10.3	6.7
Availability of safe drinking water has influenced the quality of pre-primary school education	69.1	18.1	2.8	7.0	3.0
Food safety is key to accessing quality pre-primary school education	70.1	11.9	1.9	8.3	7.8

Source: Field Data (2021)

Table 4 reveals that 62(58.8%) of the pre-primary school teachers strongly agreed with the view that the provision of supplements has enhanced the quality of pre-primary school education while 23(21.6%) agreed. On the contrary, 4(4.1%) were undecided, 11(10.4%) of them disagreed whereas 5(5.1%) strongly disagreed. These findings corroborate the assertions of Hoyland (2018) that taking food supplements is very important for children's growth and thus, children who miss such morning dietary provisions have significantly worse daily nutrient intakes, including higher intakes of total fat, and lower intakes of dietary fiber and micronutrients than those who eat nutritious breakfast. This indicates that the nutritional benefits of food supplements, vitamins and food substances are immeasurable and affect learning and learners' brain function.

Similarly, 63(59.9%) of the pre-primary school teachers strongly agreed with the view that breastfeeding of children influences the quality of pre-primary school education while 21(19.8%) agreed. However, 3(2.5%) were undecided, 13(12.2%) disagreed whereas 6(5.6%) strongly disagreed. A majority, 70(65.9%) of the pre-primary school teachers strongly agreed with the view that the provision of balanced diets is a determinant of the quality of pre-primary

school education as did 14(13.4%) of the pre-primary school teachers who agreed. However, 4(3.7%) were undecided, 11(10.3%) disagreed whereas 7(6.7%) strongly disagreed. A majority, 73(69.1%) of the pre-primary school teachers strongly agreed with the view that the availability of safe drinking water has influenced the quality of pre-primary school education while 19(18.1%) also agreed. However, 3(2.8%) were undecided, 7(7.0%) disagreed whereas 3(3.0%) strongly disagreed. A majority, 74(70.1%) of the pre-primary school teachers strongly agreed with the view that food safety is key to accessing quality pre-primary school education whereas 13(11.9%) also agreed. However, 8(7.8%) were undecided, 9(8.3%) disagreed whereas 3(3.0%) strongly disagreed. These findings support the assertions of Grantham (2015) that, in New Zealand, one-fifth of children leave for school without balanced dietary provisions and is more common among older children and those living in lower socio-economically resourced areas.

Grantham (2015) also indicates that, in Africa, poor nutrition has been associated with adverse effects on cognitive function including memory, academic performance, school attendance, psychosocial function and mood in children and young people. These findings attest to the fact that proper nutrition is associated with a range of positive outcomes, including better school attendance, academic performance, nutrient intake, fitness, and healthier body weight. Besides, proper nutrition contributes substantially to daily energy and nutrient intake. Proper nutrition contributes immensely to children's cognitive development and performance through physiological changes or reduced capacity to participate in learning activities. This implies that pre-primary school learners who take balanced diets register impressive grades in basic numeracy, language and creativity skills.

Inferential Analysis of the Influence of Nutrition on Quality of Pre-primary Education

To verify the possibility of difference between nutrition and quality of pre-primary school education, data were collected on the number of meals offered by the government per term and performance of pre-primary school learners in basic numeracy, language and creativity skills and results are shown in Table 5:

Table 5: Results of the Number of Meals Offered by the Government Per Term and Performance of Pre-primary School Learners in Basic Numeracy, Language and Creativity Skills

Number of Meals offered by Government Per Term	Performance of Pre-primary School Learners (%)		
	Basic Numeracy Skills	Language Skills	Creativity Skills
39	21	19	45
41	36	19	50
43	59	17	61
54	58	21	68
58	57	23	72
69	63	43	77
69	74	57	77
73	81	62	70

Source: Field Data (2021)

Table 5 indicates that nutrition plays a major role in the realization of quality pre-primary school education. Schools, where pre-primary school learners have a high number of meals and food ration by the government, have such learners register impressive grades in basic numeracy, language and creativity skills. These results were subjected to Pearson's Product Moment Correlation Analysis and results are shown in Table 6.

Table 6: Pearson's Product Movement Correlation Analysis of the Relationship between Number of Meals Offered by the Government Per Term and Performance of Pre-primary School Learners in Basic Numeracy, Language and Creativity Skills

		No. of Meals	Basic Numeracy	Language	Creativity
No. of Meals	Pearson Correlation	1	.861**	.895**	.885**
	Sig. (2-tailed)		.006	.003	.003
	N	8	8	8	8
Basic Numeracy	Pearson Correlation	.861**	1	.760*	.873**
	Sig. (2-tailed)	.006		.029	.005
	N	8	8	8	8
Language	Pearson Correlation	.895**	.760*	1	.641
	Sig. (2-tailed)	.003	.029		.087
	N	8	8	8	8
Creativity	Pearson Correlation	.885**	.873**	.641	1
	Sig. (2-tailed)	.003	.005	.087	
	N	8	8	8	8

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Source: SPSS Generated (2021)

Table 6 shows that there is a strong positive correlation between nutrition and quality of pre-primary school education ($r(8) = 0.861, 0.895, 0.885$, $p = 0.006, 0.003, 0.003$ at $\alpha = 0.05$). This further indicates that the role of nutrition in promoting the cognitive growth and development of children and its relation to the quality of pre-primary school education cannot be overlooked. In summary, these findings point to the fact that the nutritional value of the food children take contributes immensely to their cognitive growth and pre-primary schools ought to ensure adequate provision of nutritious mid-morning meals and lunches during school days. This helps in preparing and sustaining learners' potential learning abilities. In other words, children affected by hunger and malnutrition as well as ill-health do not have the same potential to do well at school in comparison with well-nourished and healthy children.

Thematic Analysis of the Influence of Nutrition on Quality of Pre-primary Education

Qualitative data were also collected using interviews. During the interviews, headteachers and parents' representatives noted that most pre-primary school learners receive food supplements while at school. Headteacher, H2, noted;

> *In my school, pre-primary school learners are provided with food supplements. This has motivated them to come to school and concentrate in class. This has positively affected their academic activities. In the end, they register impressive grades in basic numeracy, language and creativity skills*.

These views further corroborate the views expressed by Hoyland (2018) that diet quality and food supplements have significant effects on learning outcomes. This is since food provides fuel to the brain, diet affects cognition and behavior in various ways. In other words, diet affects cognitive functions such as memory, reasoning, attention and psychomotor coordination. On the number of meals, the headteachers and parents' representatives stated that pre-primary school learners are required to take two meals while at school. Parents' Representative, PR2, noted,

> *The government provides food ration for pre-primary school learners in the mid-morning and lunches before they go home.*

This affirms the fact that eating patterns such as eating frequency, skipping of breakfast, and frequency of meals eaten away from home might influence school-going children's nutritional status, which then influences their health and learning outcomes. From the quantitative and qualitative findings, it is evident that proper nutrition is associated with a range of positive outcomes, including better school attendance, academic performance, nutrient intake, fitness, and healthier body weight. Proper nutrition contributes immensely to children's cognitive

development and performance through physiological changes or reduced capacity to participate in learning activities and thus, register impressive grades in basic numeracy, language and creativity skills.

5.1 SUMMARY OF FINDINGS AND CONCLUSIONS

From the study findings, it is evident that many pre-primary school teachers do not complete the syllabus in time. This has hurt the quality of pre-primary school education with pre-primary school learners registering low grades in basic numeracy and language skills. However, from the study findings, many pre-primary school learners are very creative. It is also evident that nutrition influences the quality of pre-primary school education. This affirms the fact that proper nutrition is associated with a range of positive outcomes, including better school attendance, academic performance, nutrient intake, fitness, and healthier body weight. Proper nutrition contributes immensely to children's cognitive development and performance through physiological changes or reduced capacity to participate in learning activities.

6.1 RECOMMENDATIONS

The study recommends that school heads should adhere to the National Nutrition Policy Framework/Guidelines on the kinds and varieties of foodstuff pre-primary school learners should take while at school. The government should partner with stakeholders in pre-primary school education and other donors to provide resources such that there is a guarantee of supply of food ration to learners.

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