SKIN FOLD AND THIGH CIRCUMFERENCES AS FUNCTIONS OF ADEQUATE NUTRITION OF PRE-SCHOOL CHILDREN IN UYO METROPOLIS.

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ABSTRACT

The study investigated skin fold and thigh circumferences as functions of adequate nutrition of pre-school children in Uyo metropolis. The population of this study comprised all pupils in pre-schools (3-5 years) in Uyo metropolis which was about twenty five thousand (25,000). The study adopted Simple random sampling technique which was used to select 10 out of the total number of nursery schools in Uyo Metropolis. The instrument for data collection which was Anthropometrics indexes which provide an appropriate reflection of nutritional status of the pre-school children including weight and height was administered to the respondents and used for the study. Experts in test and measurement were contacted for thorough check and experts inputs before test-retest was used for the reliability of the instrument. Data collected were analyzed using appropriate statistical techniques such as percentage analysis, chart and simple regression analysis. From the results of the data analysis, it was observed that there is significant effect of adequate nutrition on skin fold of pre-school children in Uyo metropolis. Adequate nutrition has significant effect on the thigh of pre-school children in Uyo metropolis. The conclusion was that adequate nutritional intake determines the skin fold of the pre-school children and that the circumference of the thigh of the pre-school children is determined by the nutrient intake. One of the recommendations was that Government should not hesitate to make cost of living to be low so that parent will be able to provide the needed balanced diet to the pre-school children as this is essential for the determination of the circumference of the thigh.

KEY WORDS: skin fold circumference, thigh circumference, adequate nutrition, pre-school children, Uyo metropolis

Introduction

Nutrition is the study of all the elements contained in food to satisfy certain needs or requirements, in order to ensure proper growth, repairs and maintenance of the human body.. Merck and Merck (2007) opined that to receive adequate nutrition, people need to consume a healthy diet, which consists of a variety of nutrients. Nutrition Education is therefore often combined with other interactions. The impact of nutrition evaluation therefore is codetermined by a range of contextual variables which up till now, have mostly been ignored or treated as a non-treatment variable. Many nutrition education programmes have been implemented without evaluation, perhaps they have been quite successful we therefore do not know how we could improve on them, and perhaps keep repeating certain errors over and over again.

The world health organization (WHO, 2000) defined malnutrition as the "cellular inbalance between supply of nutrients, energy and the body's demand for them to ensure growth, maintenance, and specific function indicators of malnutrition include stunting, underweight and wasting. Common form of malnutrition observed most frequently in developing countries, including Nigeria, is the protein energy malnutrition (PEM). Kwashioko and Marasmms are two form of PEM that are very common.

UNICEF (2003) says proper nutrition is powerfully good; people who are given adequate nutrition are generally healthy. Healthy women, given proper and adequate nutrition as discussed above will lead more fulfilling live; healthy children learn more in school and out of school, healthy men get more strong and live long. Adequate nutrition benefits families, their communities and the world as a whole. On the other hand, Schroeder (2001) opined that lack of adequate nutrition is devastating. Lack of adequate nutrition perpetuates poverty; it blunts the intellect and saps the productivity of every one it touches. Thus quality of food and feeding is an important issue in health outcomes. UNICEF (2003) asserts that UNICEF has worked out plans to help see that every right to adequate nutrition is fulfilled. It helps children to grow and thrive as individuals. Adequate nutrition helps give every child the best start in life. Adequate nutrition helps to reduce our risk of getting infected by diseases, or incurring chronic sicknesses lick diabetes, HIV, and heart attack.

Statement of Problem

A malnourished child, research confirms, cannot perform well academically. He lacks the courage and strength to even associate with mates. Therefore, the need for a study of adequate nutrition or malnutrition on academic performance of a pre-school child becomes very apparent as every parent/teacher wants to see the child do well academically so as to be able to cope up with the task ahead of him both in school and at home. In recent years a number of studies have been carried out on the relationship between nutritional deficiencies and academic performance of children, such have been based mainly on children from poor families in latin America, India, South Africa and Colorado (Balint 1998). Similar studies are necessary in this part of the world, and it is worth mentioning here that malnutrition or adequate nutrition is a fundamental problem among Nigerian Children.

Purpose of the Study:

The objectives of the study are as follows:

1. To assess the effects of adequate nutrition on skin fold of the pre-school children in Uyo metropolis
2. To examine the effects of adequate nutrition on thigh circumference of the pre-school children in Uyo metropolis

Research Questions:

The following research questions will guide the study:

1. What is the effect of adequate nutrition on skin fold of the pre-school children in Uyo metropolis?
2. What is the effect of adequate nutrition on thigh circumference of the pre-school children in Uyo metropolis?

Research Hypotheses

The following research hypotheses will be tested at 0.05 were drawn from the level of significance

1. There is no significant effect of adequate nutrition on skin fold of the pre-school children in Uyo metropolis.
2. There is no significant effect of adequate nutrition on thigh circumference of the pre-school children in Uyo metropolis.

Literature Review

Adequate Nutrition and Skin folds

The skin is a large, metabolically active organ system that serves to protect the body from injury and infection, aid in temperature control and immuno-regulation, and act as a storage reservoir for certain nutrients. Because of its high metabolic needs, the skin has a relatively high requirement for energy, protein, and other essential nutrients.

Sausa, Elias, and Givlietti (2001) assert that nutrition can affect the skin through the development of a food allergy or hypersensitivity. Hypersensitivity to one or more components of a diet commonly manifest itself as inflammatory dermatomes. Another way that nutrition impacts skin is through the therapeutic use of specific nutrients for the control of certain types of skin diseases. Kirk (1991), observes that skin disorder that are a result of nutrient deficiency typically show a set of generalized signs that include abnormal keratinizatioin, qualitative changes in epidermal or subaceous gland lipid production, and occasionally changes in texture or colour. Excessive production of scale, erythema, or alopecia my also occur.

Sausa et al (1988), hypothesized that the source of dietary protein may affect the type and concentration of skin and serum lipid concentrations. However, recent studies by Cary et al, (1996); and Campell et al (1995); posit that feeding with pork causes a slight increase in scale and a decrease in hair regrowth. Similarly according to August (1985) and Scott et al (1995) diets that contained soy protein or a meat-based protein source were being fed, the protein had only marginal effects upon fatty acid and cholesterol concentration.

A more commonly observed way in which protein status affects the skin relates to dietary protein as potential allergens. Jeffers et al (1991); and Guilford et al (1998) say other protein dietary allergens are wheat, pork, chicken, corn, horsemeat, egg and fish. These ingredients are considered as allergens to the skin of pre-School children because of their likelihood of exposure and not due to any unique characteristics that confer increased antigenicity. That is, dietary protein source are more likely to be allergenic if they are resistant to heat and partially resistant to digestion (Reinhart and Carey, 1993). The application of heat during processing denatures proteins and reduces their antigenicity, while complete digestion by gastrointestinal enzymes renders them non-antigenic.

Fat contributes energy, essential fatty acid and palatability to canine diets. The essential fatty acid (EFA) are needed as components of cell membrane phospholipids and precursors for a variety of regulatory compounds, including the prostaglandin, leukotrierus, and other eicosanoids. In this capacity, EFAs are important for the maintenance of the epithelial tissue health and integrity of the skin.

According to Codner and Thatcher (1993), an EFA deficiency affects many part or systems of the body because of the high rate of cell turnover in the skin, the integument often show the first obvious sign of deficiency. A change in the type and quantity of lipid product by the sebaceous glands can alter the normal flora of the skin and predisposes the skin to more dangerous infection (Reinhart, 1996). Another way fat affects skin involves the amount and type of fatty acid that are contained in the nutrition supplements with certain classes of fatty acids have efficacy in the treatment of inflammatory skin disorders, that are not as a result of a dietary EFA deficiency (Watson, 1998). This effect is a result of the relationship between EFAS and other metabolites, the prostaglandins, leukotrienes, prostacy clins and thromboxarus. These are 20 carbon compounds that functions as local, short-lived inflammatory agent. The amount and type of eicosanoid synthesized is determined by the availability and type of fatty acid precursors and by the activities of the 2 metabolic enzymes systems, cyclooxydenase and lipoxygenase (Parker, 1983).

Adequate Nutrition and Thigh circumference of Pre-School children

Upper-body abdominal fat patterns; have been identified as important component of insulin resistance associated with obesity. Some researchers have adequate evidence that links thigh adipose tissue (AT) content with insulin resistance (IR). One argument is that most fat accumulation within the thigh is subcutaneous; AT can also accumulate beneath the fascia later and within muscles itself. Therefore, fat distribution within the thigh, particularly that located adjacent to or within skeletal muscle, may be associated with insulin resistance (Bret, et al 2000).

A group of researchers from the University of Pittsburgh hypothesized that compartmentalization of thigh At–At deposition between and around thigh skeletal muscle is a an important marker of insulin resistance. The researchers also examine the effects of weight loss on thigh at distribution and skeletal muscle composition. It was found out that thigh adipose tissue distribution enlarges with the weight of an individual (Bret, 2000).

Body weight has been linked to enlarged thigh of pre-scholars (Felston et al 2000), which is assumed to be due adequate nutrition. Epidemiologists suggest that adequate nutrition itself result in high body mass and balance weight. The explanation here according to Lane et al (1993) is that a well nourished pre-scholar would exhibit optimal body weight and since the body weight correlates with the thigh circumference; it is believed that a healthy individual with average body weight would have an average thigh circumference but a child who is undernourished would loose body weight and as well the adipose tissue distribution within the thigh would lean.

Proper nutrition is crucial for the appropriate development of children (TUFTS, 1998). Proper nutrition implies adequate calorie intake for optimal growth and development. It is observed that children given a well balanced diet are rich in appropriate vitamin and minerals as well. The U.S. Department of Agricultural has provided a “food pyramid” as a guide to healthy eating for children as well as adults. This suggests that a daily regimen consists of six to eleven serving of bread, rice, cereal, or pasta; two or four serving of fruits; three to five servings of

vegetable; two to three serving of dairy products; two to three servings of meat, beans, eggs, or nuts. Sweet and farts are to be consumed sparingly (Behrman, 1996).

Strauss (2001) observes that under nutrition even in mild form, can be detrimental to children's health, the more at-risk he or she is for inadequate nutrition. It is clear that the greater degree of malnutrition, the worse the outcome. Inadequate nutrition ranges from starvation state seen during famines, to the more familiar mild under-nutrition common among children of poor socio-economic standing. The body, when in a starvation state, preserves vital functions first. Thus, energy is shunted to basic metabolic tasks, leaving little energy for cognitive development and social activity.

Strauss (2001) identifies two distinct types of starvation which affects the body weight and thigh circumference:

1. Marasmus, or general calorie insufficiency, which results from inadequate calorie intake.
2. Kwashiorkor, or protein deficiency-, which results from inadequate protein intake.

METHOD

Research Design

A quasi-experimental research design will be used for the study. This design is necessary as it is experimented in nature with a capacity for comparison and correction of the variables.

Area of the Study

This area of the study is in the Uyo metropolis of Akwa Ibom State.

Population of the Study

The population of this study comprises all pupils in pre-schools (3-5 years) in Uyo metropolis. The total population for this study is about twenty five thousand (25,000).

Sample and Sampling Technique

Simple random sampling technique will be used to select 10 out of the total number of nursery schools in Uyo metropolis. This will give a sample size of 150 infants' respondents who will be used for the study

Instrumentation

The main instrument that was used in the study was Anthropometrics indexes which provide an appropriate reflection of nutritional status of the pre-school children. These include accurate measurement of weight and height. National Center for health statistics (NCHS) data was used as a standard. An interview method, with the use of questionnaire tagged, a researcher made instruments on nutrition and infant growth questionnaire (NIGQ) was used.

Validation of Instrument

Experts in test and measurement were contacted for thorough check and experts inputs. Finally, the thesis supervisor ensured that there was effective constructive criticism on the formulation of the questionnaire to measure the stipulated variables.

Reliability of the Instrument

For the reliability of the instrument, teat-retest was be used.

Data Analysis technique

The collected data were analyzed with the use of appropriate statistical techniques such as percentage analysis, chart and simple regression analysis.

Data Analyses and Result

Research Question One

The research question sought to find out the extent to which adequate nutrition affects the skin fold of the pre – school children in Uyo Metropolis.The answer to the research question is in table 1

Table 1

Effects of adequate nutrition on skin fold

Nutrition	**Skin Fold**		
	N	**$\overline{X}$**	**SD**
Very rich	32	7.45**	1.26
Rich	**45**	**6.88**	**1.10**
Not rich	**73**	**5.69***	**0.64**
Total	***150***	***6.44***	***1.22***

*****The highest mean score***

***The least mean score**

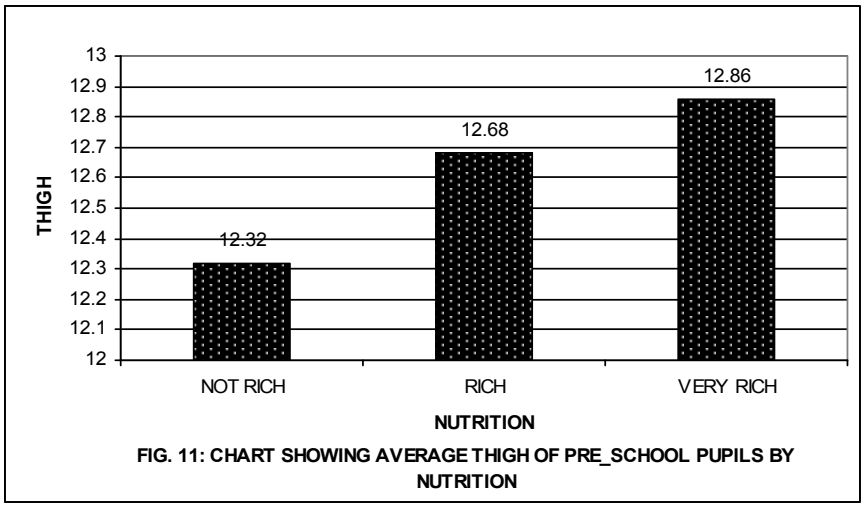

FIG. 11: CHART SHOWING AVERAGE THIGH OF PRE_SCHOOL PUPILS BY NUTRITION

Fig. 1

The above table shows the level of effect adequate nutrition has exerted on the skin fold of pre-school children in Uyo metropolis. From the result, it was observed that pre- school children that the fed with very rich nutrition had the highest skin fold (7.45). this was seconded by those of rich nutrition (6.88) while pre-scholars with the least head circumference were those fed with fairly rich nutrition (5.69). this result therefore implies that adequate nutrition has a remarkable effect on the head circumference of pre- school children in Uyo metropolis.

Research Question Two

The research question sought to find out the extent to which adequate nutrition affects the thigh of the pre – scholars in Uyo metropolis.

The answer to the research question is in table 2

Table 2

Effects of adequate nutrition on thigh circumference of Pre–school children in Uyo Metropolis.

Nutrition	Thigh		
	N	$\overline{X}$	SD
Very rich	32	12.86**	1.09
Rich	45	12.65*	1.12
Not rich	73	12.32*	1.12
Total	**150**	**10.54**	**1.13**

**** The highest mean score**

*** The least mean score**

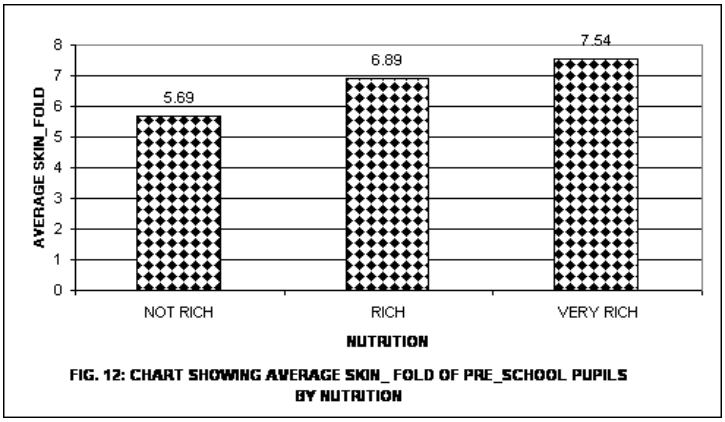

FIG. 12: CHART SHOWING AVERAGE SKIN_FOLD OF PRE_SCHOOL PUPILS BY NUTRITION

The above table shows the level of effect that adequate nutrition has exerted on the thigh of pre- school children in Uyo metropolis. From the result, it was observed that pre- school children fed with very rich nutrition had the highest thigh development (12.86). The was seconded by those that were fed with rich nutrition (12.65) while pre-school children that were fed with fairly rich nutrition had the least thigh development (12.32). This result therefore means that adequate nutrition has a remarkable effect on thigh of pre- school children in Uyo metropolis.

Hypothesis One

The null hypothesis states that there is no significant effect of adequate nutrition of skin fold of pre-scholars in Uyo metropolis.

In order to test the hypothesis independent and dependent variable were identified. The variable were subjected to simple regression analysis in order to generate the predicted (ŷ) value as the value of Y (skin fold) for X^1 as the value of X (adequate nutrition). (See table 3)

Table 3

Model summary of the effect of adequate nutrition on skin fold of pre-school children in Uyo metropolis.

Model	R	R-square	Adjusted R-square	Std error of the estimate
1	0.626[a]	0.392	0.388	0.95263

P< 0.05; df=148; critical R-value= 0.174

From the table above, the calculated R-value 0.626 was greater than the table R-value of 0.174 at 0.05 alpha level with 148 degree of freedom. The R-square value (coefficient) of 0.392 predicts 39% of the effect of adequate nutrition on skin folds of pre-scholars in Uyo metropolis. With regard to the R-value of 0.626, the rate of percentage (63%) is highly positive and implies that adequate nutrition has a high & positive significant effect on the skin fold of pre-school children in Uyo metropolis.

Hypothesis Two

The null hypothesis states that, there is no significant effect of adequate nutrition on thigh circumference of pre- school children in Uyo metropolis.

In order to test the hypothesis, independent and dependent variables weresubjected to simple regression analysis in order to ($\hat{Y}$) value of y (high) for $_{x1}$ as the value of x (adequate nutrition). (See table 4).

Table 4

Model summary of the effect of adequate nutrition on thigh circumference of pre-school children in Uyo Metropolis

Model	R	R-square	Adjusted R-square	Std Error of the Estimate.
1	0.200 [a]	0.040	0.033	1.10800

P< 0.05;df = 148; critical R- value = 0.174

The above calculated R-value 0.200 was greater than table R- value of 0.174 at 0.05 alpha level with degree of freedom. The R- square value of 0.04 predicts 4% of the pre-school children in Uyo metropolis. With regard to the R- Value of 0.200, the rate of percentage is lowly positive and therefore implies that adequate nutrition has positive but low significant effect on the thigh circumference of pre-school children in Uyo metropolis.

Discussion of the Findings

The result of the data analysis in table 3 was significant due to the fact that the obtained R-value (0.62.6) was greater than the 0.05 level with 148 degree of freedom. This result implies that adequate nutrition has a significant relationship with the skin fold of the pre- school children in Uyo metropolis. The significance of the result is in support of the opinion of Sausa et al (1988) who asserted that nutrition can affect the skin through the development of fold allergy. Another way which nutrition impact skin is through the therapeutic use of specific nutrient for the central of certain types of skin diseases. The significance of the result caused the null hypothesis to be rejected while the alternative accepted.

The result of the data analysis in table 4 was significant due to the fact that the abstained R- Value (0.200) was greater than the critical R- value (0.174 at (0.05) level with 148 degree of freedom. This means that adequate nutrition has significant relationship with the thigh of the pre-school children in Uyo metropolis. The significance of the results is in the line with idea of Felston et al (2000) who said that body weight have been linked to enlarged thigh of the pre-school children. He assumed it to be due to adequate nutrition. The significance of the result caused the null hypothesis to be rejected while the alternative accepted.

Conclusion

Based on the findings of the study, it was concluded that adequate nutritional intake determines the skin fold of the pre-school children. The circumference of the thigh of the pre-school children is determined by the nutrient intake.

Recommendation

From the findings, the researcher deemed it necessary to submit the following recommendations:

1. Adequate nutrition is necessary for the skin fold of the pre-school children in Uyo metropolis. Children should not fail to take drugs that will repair the damage cells of the upper layer of the skin.
2. Government should not hesitate to make cost of living to be low so that parent will be able to provide the needed balanced diet to the pre-school children as this is essential for the determination of the circumference of the thigh.

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