



Prevalence of consumption of Empty Calories (ECs) among ECCE attending children in Ringim, Jigawa

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ABSTRACT

Like other beings, children are only able to learn and develop properly if they are consuming healthy foods, instead of unhealthy empty calories, especially at Childhood Care and Education (ECCE) level. Poor dietary experience will surely affect Childhood Care and Education (ECCE) and have a long-lasting effect in the entire life. Childhood Care and Education (ECCE) This study aimed to determine the prevalence of empty calories consumption among Early Childhood Care and Education (ECCE) attending children in Ringim, Jigawa State, Nigeria. A random sampling procedure was used to select 133 participants. Data was collected using a questionnaire and visual observation. Results showed that 57.9% of the children consumed empty calories, with macaroni, spaghetti, and beverages being the most common types. Thus, the implications of this finding is that, the future leaders (children) are exposed to unhealthy foods at schools, which is a risk that is linked to several deadly disorders such as diabetes, cancers, heart disease, hypertension, malnutrition, and so on. Therefore, the future of the society may be at risk. In this vein, all policies makers including the parents should be educated (informed) about dangers of empty calories to children and means to scuttle escalation of the problem. Indeed, the study highlights the need for nutrition education and interventions to promote healthy eating habits among ECCE attending child.

Keywords: Empty calories, Early Childhood Care and Education (ECCE), Children, Nutrition, Healthy foods, *Tuwo*



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INTRODUCTION

The entire life of humans can be shaped by early experiences. Development of humans starts at early ages. Children development occur through gradual processes that unfold biological traits due to experiences from the environment. Children at younger age needs care because they learn through seeing, hearing, doing, and touching. They are naturally aroused social begins with great social ability and curiosity allowing them to learn as they grow older (Sarkingobir, Nahantsi, et al., 2019; Sarkingobir, Sahabi, et al., 2019; UNICEF, 2019). Childhood Care and Education (ECCE) provides social, cognitive, emotional, and other benefits that help children to develop a string sense of academic and social success and potential (Rotshak et al., 2020). The ECCE benefits include, likelihood to pursue higher education and do well, development of hearing and language skills, critical thinking and other cognitive development, numeracy and literacy foundation, self-regulation and self-efficacy development, lifelong learning skills, good health habits, making friends, etc. Overall, the Childhood Care and Education (ECCE) helps in brain, health, academic, and other form of development in children (Viskovic, 2021; Yaswinda et al., 2021).

However, before a biological system can carry out any function of life it requires foods. The foods must be healthy. Children at schools require foods and must abstain from unhealthy foods like empty calories if achievement are to be recorded. The body system of our body needs tiny nutrients that

are essential for proper functioning of the body (Michigan WIC Program, 2022). Carbohydrates are the major providers of energy to the body daily, and fats perform transport of nutrients and are utilized in many cell structures in the body. Fats are equally utilized to provide energy to the body in two-fold greater than carbohydrates. Proteins are made up of tiny amino acid constituents utilized to build new body structures, repair tissues, and ensure maintenance of tissues of the body; while vitamins are extremely important due to their role in all kinds of biological reactions occurring in the body (Michigan WIC Program, 2022). Minerals are similar to vitamins due to their roles in ensuring that chemicals reactions are occurring in the biological systems; while, the is important to the body for diverse array of processes, that is why we cannot survive over three days without water (Michigan WIC Program, 2022). But, UNICEF (2019) disclosed that, we are changing in where we live, women are changing roles from being caregivers at home to being workers, many families are leaving the farms and joining the workforces at cities, we are changing and leaving what we eat traditionally and embracing modern diets that are full of sugars, fats, nutritionally-deficient, and leading to a large population of children being overweight and obese around the world (UNICEF, 2019). The aforementioned factors are causing the children's malnutrition nowadays. At least 1 out of 2 children suffers from malnutrition (micronutrient deficiencies) called hidden hunger. Many places around the world are experiencing triple burden of malnutrition, namely, undernutrition, hidden hunger, and overweight; therein are al diet-related issues (UNICEF, 2019). Indeed, at all ages children should eat diet that are of enough nutrients, and diverse, but eating too much sugar, salt, and (or) fat endanger their health and future. The risk of malnutrition at every age of children may affect academic performance among other indices. The risk for children nutritionally at age 2-6 include poor diet, excess empty calories intake, marketing unhealthy stuffs (empty calories), and lack of exercise (UNICEF, 2019).

Empty calories (ECs) are types of stuffs consumed by many, but they are popular because of their added sugars, added solid fats, preservatives, and similar contents. Examples of empty calories include beverages, soft drinks, candies, donut, pizza, ice cream, sausages, etc (Bashar, 2025). Empty calories are popular and they are prevalent in societies, such as school communities due to a number of reasons. The ECs stuffs ae prepared to give dynamic sensation to the consumers, thereby encouraging demand. The ECs stuffs ate also prepared to elicit sensory receptors of the body, more especially, the sweet, sour, salty, and umami, which are a sense of reward in the nervous system; thereby encouraging demand for consumption (Rezaei, 2017; Sarkingobir & Yusuf Yahaya Miya, 2024). Other peculiarities of empty calories eliciting more or excess intake include, the fact that, may people are busy (for instance women are increasingly entering the labor workforce and abandoning the role of cooking foods at home), empty calories companies are very excessive and improvising many ways to persuade customers such as through marketing (using social media) (Mateljan, 2021).

Kaur et al. (2017) disclosed that, ECs consumption is encouraged because, women have no time to cook foods, ECs are cheap to buy, media campaigns by ECs agents are intensified, and peer pressure is certainly influencing the young ones to take ECs. However, consumption of empty calories may lead to addiction, and in turn eliciting disastrous effects on consumers (Howland, 2018; McGill, 2014). Ecker et al. (2020) stressed that, Nigeria faces a rising burden if malnutrition, such as childhood malnutrition (a prevalent issue). The two major nutritional burden include, the macronutrients malnutrition, and as well micronutrients malnutrition; therewith, every one of them may lead to long-lasting effect on people affected and to the country or society at large (Ecker et al., 2020).

An empty calories stuff is harmful because it causes malnutrition (Johar, 2016). ECs are dangerous due to their properties. The properties of ECs making them harmful include, lack of nutrients at all or envisaging very little nutrients, envisaging huge unhealthy calories, envisaging much amount of preservatives or combinations. The ECs are found in soft drinks, sweets, spaghetti, macaroni, alcohol, biscuits, sport drinks, etc (Meena et al., 2023). Indeed, the nature of empty calories make them harmful; therewith, excess contents of the stuffs cause dietary disorders including diabetes, cancers, heart disease, obesity, hypertension, malnutrition, etc. Lane et al. (2024) In a meta-analysis study disclosed that greater exposure to empty calories is a pattern of consumption that is linked to high risk of adverse effects such as mental disorder, increased mortality. Indeed, the issue of nutrition especially in children is very critical. Dietary disorders cause premature deaths or disabilities. These dietary related disorders include, hypertension, diabetes, obesity, stroke, dyslipidemia (Rasheed et al., 2021). Poor nutrition pattern nowadays has cause emergence of disorders that were once adult-onset to be now prevalent in

children and youngsters (Lucan et al., 2010). The objective of this work was to determine the prevalence of empty calories consumption among ECCE attending children in some schools in Ringim, Nigeria.

RESEARCH METHOD

The study was conducted in the town of Ringim, Jigawa State, Nigeria among some private schools offering ECCE services to children. A random sampling procedure was utilized to select the participants of the study (with the consent of their teachers), and a total of 133 participants were included. The data collected using a questionnaire and visual observation about pattern of ECs consumption, and availability of ECs at school premises, was analyzed using descriptive statistics. The questionnaire used for observing the kind of food brought by children at ECCE contains information about characteristic of the participant, and type of food brought to school and was validated and tested for reliability. The consent of the children was sought through their teachers or administrators; no harm was inflicted on the children during the conduct of the study. Whereas, the observation was done through inspection and the kinds of food around school premises were noticed and recorded.

RESULT AND DISCUSSION

The results for this study were shown in Tables 1-4.

Table 1. Characteristics of children

	Frequency	Percentage
Age		
5 years old	40	30.1
6 years old	93	69.9
Sex		
Male	116	97.2
Female	17	12.8
Religion		
Islam	124	93.2
Christianity	9	6.8

Table 2. Types of foods brought to school by children

Types of food brought to school	Frequency	Percentage
<i>Tuwo</i> (rice)	12	9.0
<i>Tuwo</i> (maize)	16	12.0
Rice	6	4.5
<i>Tuwo</i> (sorghum)	5	3.8
Macaroni	32	24.1
Spaghetti	24	18.0
<i>Kunu</i> (millet or sorghum)	17	12.8
Beverages	21	15.8

Table 3. Prevalence of empty calories consumption

Prevalence of empty calories consumption	Frequency	Percentage
Empty calories	77	57.9
Healthy foods	56	42.1
Total	133	100.0

Table 4. Sources of ECs at school premises

Prevalence of empty calories consumption	Frequency	Percentage
Chocolate	25	18.8
Chewing gum	24	18.0
Other empty calories	48	36.1

Prevalence of empty calories consumption	Frequency	Percentage
Healthy foods	36	27.1
Total	133	100.0
Overall prevalence of		
Healthy foods	97	72.9
ECs	36	27.1

Discussion

Based on the results in Table 1 about characteristics of the children enrolled in the study, most of the children are 6 years old (69.9%), males (97.2%), and Muslims (93.2%). Table 2 shows the types of foods been consumed by children at ECCE classes in some schools in Ringim, Jigawa. The prevalence of various foods consumption is as follows; Macaroni (24.1%), spaghetti (18.0%), beverages (15.8%), *Kunu* (12.8%), *Tuwo* (maize) (12.0%), *Tuwo* (rice) (9.0%), rice (4.5%), and *Tuwo* (sorghum). The consumption of *Tuwo* (from rice, maize, sorghum), *Kunu* (from millet or sorghum) and rice is important and beneficial to health of the developing young ones (children) more especially because they require these foods for health, growth, and development (Sarkingobir & Yusuf Yahaya Miya, 2024). The kids of food groups determined here, include, millet, sorghum, rice, which are cereals or grains. Cereals or grains (unless refined) are important food groups providing energy, vitamins and minerals needed for proper functioning of the body (Mateljan, 2021; UNICEF, 2019). These are classified as healthy foods, in contrast to the empty calories such as beverages, macaroni, and spaghetti that are categorized as unhealthy foods. Therefore, it is important to come up with interventions that encourage consumption of healthy foods. The interventions include, encouraging smallholder farming, awareness creation among teachers, parents, and children. Parents should properly monitor the food consumption of their wards, while the teachers should make policies that shield schools against empty calories selling and buying at premises (Lane et al., 2024).

In Table 3, the prevalence of empty calories consumption at schools was 57.9%, which is higher than that of healthy foods consumption (42.1%). This is similar to the finding of revealed in a study conducted by Vidya et al. (2015) in Bangalore among children, which revealed that majority of the subjects of the study consumed fast foods, candies, and soft drinks. In a similar tune, Reedy & Krebs-Smith (2010) reported that there is far exceeding consumption of required dietary amounts in children in united states of America. Mukoru et al. (2023) from Southern part of Nigeria revealed that, there was high percentage of intake of fast foods in children and adolescents. Similar results from Tassy et al. (2021) in Ibadan show that, majority of the children 4-13 years old are experiencing hidden hunger (micronutrients deficiency) as a result of dietary imbalance. Moreover, Rezaei et al (2017) reported high intake of empty calories among the students and young ones in Yasuj, Iraq.; (Sarkingobir, Nahantsi, et al., 2019) reported high prevalence of food insecurity among children in Almajiri Schools in Sokoto, Nigeria. Therefore, due to globalization of everything including nutritional aspects, the children in Nigeria are been exposed to similar harmful dietary pattern like their counterparts. Thus, intensive nutrition education in children and parents is needed (UNICEF, 2021).

Table 4 reveals the accessibility or availability of foods or empty calories at ECCE school premises. Therein, the prevalence of the available types of food sis as follows: Empty calories (36.1%), healthy foods (27.1%), chocolate (18.8%), and biscuit (18.0%). The overall prevalence of ECs was 72.9%, and that of healthy foods was 27.1%. based on this availability there are more empty calories at schools' environments than the healthy foods. Therefore, this pattern whereby empty calories are available, abundant, and accessible at school environment is harmful to the health of children, because it is a kind of food swamp. A food swamp is an environment characterized with redundancy of empty calories which are in turn unhealthy to man, let alone children. The food swamp encourages the children to buy and consume empty calories easily, it has also elicited addiction to empty calories, as well; because humans love sweet or flavored stuffs. The children have poor knowledge of consequences of empty calories consumption to the health, and have good knowledge of taste (their body like sweet or flavored stuffs) (Collado-Soler et al., 2023; Vidya et al., 2015). Thus, according to socioecological model, health or behavior change is determined by several factors at different levels. Here, the love

sweet or flavor, curiosity, poor knowledge of harms of ECs are intrapersonal factors of ECCE attending children; while, the availability of ECs abundantly at ECCE environment is an institutional factor, which is beyond the children, but within the powers of school authorities and government (Collado-Soler et al., 2023).

Nevertheless, the finding of this study which shows, the availability of ECs at ECCE premises is similar to other findings, such as Poti et al. (2014) which reported stores and schools as major sources of empty calories to children in United States of America; and that of Lucan et al. (2010) that reports congestion of most of the stores with unhealthy foods. Therefore, the children are exposed to health problems if care is not taken (Lucan et al., 2010). Consequently, for good and bright future devoid of much health disparities, there is need to feed children with healthy foods, so that they can grow well, learn well, and developed to achieve full potentials and support the country.

Certainly, ECCE attending children are of great benefits to acquire social, academic, cognitive health, and other benefits compared to their counterparts (Srinivasacharlu, 2024), but they need healthy foods from local or naturally-made food such as grains, cereals, fruits, vegetables, legumes, etc to achieve the aims and successes of ECCE. It is indeed clear to state that consumption of ultra-processed stuffs such as empty calories is harmful to health of the young people more than other groups and affect their health and productivity in future. To avoid empty calories polices restricting bringing empty calories to schools should be adopted a squarely (Howland, 2018; Sarkingobir & Yusuf Yahaya Miya, 2024). The implications of empty calories are many. They starve the body of useful micronutrients required for carrying out normal metabolic and anatomical functions, therefore, the imported fuels (from empty calories and others) tend to accumulate leading to effects such as obesity, overweight, and other ultimate consequences (such as hypertension, diabetes, etc). Apart from that, the empty calories because they are chemically manufactured expose the kidney and liver to xenobiotic metabolism, a condition that may result to failure if the exposure is long. Other effects of empty calories include, lack of antioxidants, change in behaviors, and addiction (Mateljan, 2021; Sarkingobir, 2025; Sarkingobir & Yusuf Yahaya Miya, 2024).

CONCLUSION

The study revealed a high prevalence of empty calories consumption among ECCE attending children in Ringim, Jigawa State, Nigeria. The availability of empty calories at school premises and the lack of nutrition education contribute to this problem. To address this issue, interventions such as nutrition education, awareness creation among teachers, parents, and children, and policies to restrict the sale of empty calories at school premises are necessary. Promoting healthy eating habits among children is crucial for their growth, development, and future health.

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