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**SUGAR CONSUMPTION AMONG PRIVATE SECONDARY SCHOOL STUDENTS IN DUTSIN-MA TOWNSHIP, KATSINA STATE, NIGERIA**

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**Abstract**

*This study assessed sugar consumption among private secondary school students in Dutsin-Ma Township Katsina State, Nigeria. Three hypotheses were tested in the study. Descriptive survey research design was used. The population of this study comprised 175 (junior and senior) students of the three existing private secondary schools in Dutsin-Ma. The entire student population was studied. A self-constructed questionnaire with a four-point Likert scale was used to collect data. The instrument was validated by four health experts. Split-half method was used to determine the reliability of the questionnaire and a reliability coefficient of 0.67 was obtained. Data collected were analysed using frequency counts and percentage for rendering the demographic profile of the respondents and answering the first research question. The t-Test was used to test the stated hypotheses at level of 0.05. The study found that most of the students (58.29%) consume more artificial sugar than sugar obtained from natural sources. The study also found significant differences in sugar consumption between students in junior secondary classes and those in senior secondary in their consumption of sugar ( $p < 0.05$ ). However, the study found no significant gender difference in the consumption of sugar among the students. Based on these findings, the study recommended a reduction in consumption of sugar by students particularly unwholesome foods such as biscuits and soft drinks rich in sugar.*

**Keywords:** Sugar consumption, Secondary School Students.**DOI:** <https://doi.org/10.35386/ser.v18i1.45>**Introduction**

Sugar is a chemical compound found in foods (both organic and inorganic) people consume daily which promotes health at a required intake. Generally, sugar is either natural sugar or artificial but, in most cases, artificial sugar serves as food additives (Murphy & Johnson, 2003). There are two kinds of sugar classification namely, natural sugar obtained from fruits, vegetables, cereals, grains and staples like yam and cassava; and artificial sugar sourced from soft drinks, all candy substances, dairy products, and direct table sugar, to mention a few. Sugar is found in carbohydrate, protein and fatty foods, cakes, chocolates, fruits, pies, soft drinks, vegetables and dairy products (Whiteman, 2016). Whiteman further stated that both kinds of sugar complement each other because they are somewhat inseparable in the health effects they are associated with.

The fact that sugar is a ubiquitous compound in daily food supply does not mean that one should not maintain an equilibrium sugar level in the body for a healthy living. Sugar is an integral part of human daily food. Yet, its gross intake leads to un-transferable health problems such as diabetes, obesity and depression. According to Correa-Burrows, Burrows, Estela, Marcela and Sheila (2016), sugar is absolutely classified as unhealthy meal owing to the health problems that are basically associated with it. Kirtida (2011) names carcinogenicity (cancerous-risk factor) as caused by excess sugar intake. Other sugar-related problems could be over-weight, dilution of nutrients or inhibiting them from being used by the body, brain problem, hastened

ageing, cardiovascular diseases, obesity as well as cancer (Murphy & Johnson, 2003; Gregoire, 2015; Whiteman, 2016).

Several studies have shown that gross or excessive consumption of sugar is highly associated with a variety of health consequences ranging from mild to severe health consequences. A study conducted by Kirtida (2011) which focused on sugar substitutes: health controversy over perceived benefits, revealed that too much intake of sugar is not good and may endanger human teeth and waist line. Gregoire (2015) who studied what sugar does to the brain found out that sugar intake in excessive form is bad and dreadful to human waistline and heart health hence, it poses danger to the brain functions and mental well-being.

Two studies by two different researchers revealed that high intake of sugar is associated with dental caries and cariogenic effects (Sheiham, 1991; Burt, 1993). Distinct multiple studies revealed that low fat diet approximately 20 per cent total energy obtained from fat usually accompanied by a high intake of carbohydrate could precipitate metabolic changes which might lead to atherogenic dyslipidaemia and high sugar consumption separately associated with increased risk of cardiovascular disease. Human cognition can be influenced by high intake of sugar through the various sources. Wolraich, Wilson and White (1995) investigated the effect of sugar on behaviour and cognition in children. According to the researchers a meta-analysis of sugar intake and children's behaviour and cognition performance found little evidence of an association.

This scant evidence is nonetheless a basis to argue that high intake of carbohydrate-sugar can change behaviour negatively, particularly cognitive activities. High ingestion of sugar decreases attention span and memory as it aids the secretion of a brain hormone that impedes the memory (Effect, 2015). It further reveals that chronic sugar consumption can lead to permanent impaired memory function. Gregoire (2015), in his study, found out that sugar hijacks the brain's reward pathway leading to some unfortunate events such as loss of control, and high craving for sugar as a result a surge in the release of dopamine. The physiological effects of sugar to the brain cannot be undermined because the brain still needs glucose, which is sugar inside the blood stream, to function at required and regulated amounts.

Across the globe, the demand and consumption of sugar is on the increase. For instance, the intake of sugar in Mexico doubled between 1999 and 2006 irrespective of age groups (Kelly, Thomas, Walter, Barry, Frank, Joseph & Davido, 2009). Reports show that the price of sugar in East-Africa rose incredibly owing to some factors including high demand for it (Matsiko, 2017). Matsiko further stated that in Uganda, the price of sugar rose to US\$1.21 and US\$1.41 against the initial US\$0.98 due to high demand. Mwine Jim Kabeho, the chairman of Uganda Sugar Manufacture Association, in a letter to the ministry of Trade, Industry and Co-operatives, stated that the minimum cane price has virtually doubled, from US\$23.8 per ton in April 2016 to US\$44.8 currently (Matsiko, 2017).

All human age distributions need and consume sugar (natural and artificial), but in Nigeria, especially Katsina State, it is assumed that children in the post-primary schools in Katsina State particularly in Dutsin-Ma Local Government Area consume artificial sugar more probably because of its unmatched sweet taste in the mouth. It is

believed that children of this age group in Dutsin-Ma could go for foods rich in sugar like soft drinks and cake in place of ground nuts or fruits for lunch at schools. Hence, it is observed that they take their morning tea locally called ‘*Shayi*’ and ‘*Fura Da Nono*’ as a post morning food with significant amount of artificial sugar (table sugar) almost on daily basis. However, these observations required some empirical validation. It is for this reason that the researchers investigated patterns of sugar consumption among secondary school students in Dutsin-Ma Township, Katsina State, Nigeria.

### Research questions

1. Which type of sugar do the private secondary school students in Dutsin-Ma Township consume most?
2. Is there any significant difference in the consumption rate of natural and artificial sugar among private secondary school students in Dutsin-Ma Township, Katsina State?
3. Is there any gender difference in the consumption of sugar by the students?
4. Is there difference between junior and senior secondary school students in their consumption of sugar?

### Hypotheses

#### Major hypothesis

H<sub>01</sub>: There is no significant difference in the consumption rate of natural and artificial sugar among secondary school students.

#### Sub-hypotheses

H<sub>01</sub>: There is no significant gender difference in the consumption of sugar among private secondary schools’ students in Dutsin-Ma, Katsina State.

H<sub>02</sub>: There is no significant difference in the consumption of sugar between junior and senior secondary schools students among private secondary schools’ students in Dutsin-Ma, Katsina State.

### Methodology

Descriptive survey research design was used in this study. The population of the study was all the 175 students of the three existing private secondary schools in Dutsin-Ma Township. The researchers used the whole population in the study.

**Table 1: The existing private secondary schools with their students’ population in Dutsin-Ma Township**

S/n	Schools	Students’ population
1.	Dammy Preparatory School	67
2.	Zunnu Rain Comprehensive High School	50
3.	Mariamoh Ajiri Memorial Int’l. School	58
	Total	175

A self-constructed questionnaire with a four-point Likert scale named Sugar-Consumption Questionnaire (S-CQ) was used to collect data. However, the instrument contained ‘yes’ or ‘no’ items that address research question one. The questionnaire was constructed to seek information on demographic data, kind of sugar and difference in the consumption of natural and artificial sugar among private secondary schools’ students in Dutsin-Ma Township. The instrument contained Section ‘A-C’. Section A sought demographic information of the participants. Section B sought information on the kind of sugar the students consume most, while section C sought information on difference between natural and artificial sugar consumed by the students.

The instrument was validated by four health experts. Split-half method was used to determine the reliability of the research instrument using Cronbach’s alpha and 0.67 reliability index was obtained. Data generated were subjected to frequency count and percentage for the demographics and research question one. Meanwhile, t-Test was used to test all hypotheses at 0.05 level of significance, using Statistical Package for Social Sciences (SPSS) version 20.0.

## Results

The findings of this study are on Tables 2-4.

**Table 2: Demographic information of the participants**

Variables	Dammy Preparatory School	Zunnu Comprehensiv e High School	Rain Mariamoh Ajiri Memorial Int’l. School	Total	%
Gender					
Male	31	24	31	86	49.14
Female	36	26	27	89	50.86
Total	67	50	58	175	100.00
Class					
Junior class	46	50	52	148	84.57
Senior class	21	0	6	27	15.43
Total	67 (38.29%)	50 (28.57%)	58 (33.14%)	175 (100%)	100.00

Table 2 shows that there are 86 male students representing 49.14 per cent and 89 female students representing 50.86 per cent obtained from three selected schools. It also shows that there are 148 (84.57%) junior students while senior students are 27 representing 15.43 per cent.

Research question one: Which type of sugar do the private secondary school students in Dutsin-Ma Township consume most? (See Table 3 for an answer).

**Table 3: Types of sugar private secondary schools' students in Dutsin-Ma Township consume**

S/n	Sugar consumed	Frequency	Percentage (%)
1.	Natural sugar	73	41.71
2.	Artificial sugar	102	58.29
	Total	175	100.00

Table 3 shows that 73 students representing 41.71 per cent indicated that they consume natural sugar, while 102 (or 58.29% of the students) indicated consumption of artificial sugar.

**Table 4: t-Test on different rate between natural and artificial sugar consumption and difference in gender, and junior and senior students in the consumption of sugar**

Variable	N	Mean	Std. devia	Std. error mean	T	df	p-value
<b>Sugar</b>							
Natural sugar	175	23.83	2.664	.201	118.327	174	.001
Artificial sugar	175	52.42	5.788	.438			
Total	175						
<b>Gender</b>							
Male	88	75.91	6.318	.681	-.654	173	.514
Female	89	76.57	7.113	.754			
Total	175						
<b>Class</b>							
Junior class	148	75.81	6.797	.559	-2.021	173	.045
Senior class	27	78.63	5.858	1.127			
Total	175						

t=1.645 at df=174 (p<0.05), t=1.960 at df=173 (p>0.05) & t=1.960 at df=173 (p>0.05).

Table 4 shows that the mean value of natural sugar source is less than artificial sugar (23.83<52.42). It also shows that p-value is less than level set for the study (p<0.05). The null hypothesis which stated no difference in the consumption rate of natural and artificial sugar among private secondary schools' students is rejected. Hence, rate of natural and artificial sugar consumption among private secondary school students are significantly different (p< 0.05). Hence, artificial sugar mean value is greater than natural sugar mean value (52.42> 23.83).

The null hypothesis which stated that there is no significant gender difference in the consumption of sugar among private secondary schools' students is accepted. This is because the mean value of sugar consumption among male students is less than female mean value (75.91<76.57). Additionally, the p-value is greater than the level of significance (p>0.05). Hence, there is no significant gender difference in the consumption of sugar among private secondary school students in Dutsin-Ma Township (p>0.05).

Equally, the study shows that the mean value of junior class is less than mean value of the senior class (75.81<78.63). It shows that p-value is less than the level of

significance ( $p=.045<0.05$ ). The null hypothesis which stated that there is no significant class difference in the consumption of sugar among private secondary schools' students is rejected. Hence, there is a significant difference in the consumption of sugar among private secondary schools' students by class or level study in Dutsin-Ma Township ( $p<0.05$ ).

## **Discussion**

The study found that private secondary school students in Dutsin-Ma Township consumed artificial sugar more than they do natural sugar. This finding is in agreement with Delia, Zoran, Donna, Elaine, Thea, Creshelle, Glen and Kenya (2012), who researched on self-reported sugar-sweetened beverage intake among college students and found out that 95 per cent of the students reported more sugared beverage intake in the past month than any other type of sugar and 65 per cent of them reported daily intake of artificial sugar. The finding is also in congruence with the result Alexandre, Pascale, Eric, Benoit, Ramona and Sherri (2016) which found that students' risk of consuming added sugar on a daily basis increased by 72% (MOR = 1.72). Meanwhile, Onyiriuka, Ibeawuchi and Onyiriuka (2013), in their study found out that 60 per cent of the participants consumed fast foods with 76 per cent of them consuming fast foods along with soft drinks. It is also in line with study of Carmen, Veronica, Marian, Valerio, Iginio and Ricci (2015), whose results showed a significantly higher consumption of sweet beverages, snacks, milk-based beverages, low-carbohydrate drinks, fruit, and vegetables out-of-the school among students.

It is expedient to note that the percentage that makes up the finding of this study which reveals that private secondary schools' students in Dutsin-Ma Township consume artificial sugar most 102 (58.29%) is quite less when compared with the findings of Delia *et al.* (2012), Alexander *et al.* (2016), Onyiriuka *et al.* (2013) and Carmen *et al.* (2015) as stated above. However, the percentage is greater than the one reported by Sisko, Eino and Nameer (2009), whose results showed that school children were consuming 42 per cent of sweets, 43 per cent soft drinks and 31 per cent cakes several times a day. The researchers agreed that the result is so because the participants are school children who eat anything they see or access irrespective of wholesomeness of the products.

This study found significant difference in the consumption rate of natural and artificial sugar among private secondary schools' students ( $p<0.05$ ). This result agrees with finding of Niina, Miinna, Noora, Liisa, Kenneth, Satu (2017), which found that high added sugar intake was associated with low fibre intake ( $P < 0.0001$ ) accompanied with lower fruit ( $P < 0.0001$  women;  $P = 0.022$  men) and vegetable consumption ( $P < 0.0001$ ) and higher wheat consumption ( $P = 0.0003$  women;  $P < 0.0001$  men). Opposite results were found for naturally occurring sugar. Butter consumption increased by 28–32 % ( $P < 0.0001$ ) when shifting from the lowest to the highest added sugar intake quartile, while a decrease of 26–38 % ( $P < 0.0001$ ) was found for naturally occurring sugar.

The researchers agree with the result because the participants are taking more artificial sugar than natural sugar. They can take soft drinks and biscuits richly in sugar for their lunch owing to their affordability and accessibility in their locality

even at the schools. They hardly take the natural sugar given foods without the support of the artificial sugar sources.

This study reveals that there is no significant gender difference in the consumption of sugar among private secondary schools' students ( $p > 0.05$ ). This finding agrees with Laverty, Magee, Monteiro, Saxena and Millett (2015), whose finding reveals that school boys and girls age eleven years and above have no significant difference in the manner in which they consume sugar weekly. However, the finding of this study is not in agreement with the result of Bruce, Beech, Thorpe, Mincev and Griffith (2017), which reveals that there is gender difference in consumption of sugar. This finding is so because the participants fall into the same socioeconomic status and such could predict their nutritional choice despite gender differences.

The finding of this study also reveals that there is significant difference between the junior and senior classes in the consumption of sugar among private secondary schools' students in Dutsin-Ma Township ( $p < 0.05$ ). This finding agrees with the finding of Delia *et al.* (2012), which revealed that junior students reported significantly higher intake of added sugar than senior students ( $p = 0.025$ ). The researchers acknowledged the finding since participants have similar background and eat almost the same type of foods, but at distinct time frame.

## **Conclusion**

Following the findings of this research work, it is concluded that the private secondary schools' students in Dutsin-Ma Township consume artificial type of sugar most and it is significant. In the consumption of sugar generally, difference was not found between male and female students whereas, junior and senior secondary school students differ in their consumption of sugar generally.

## **Recommendations**

Based on the findings of this study, the following recommendations are proffered:

1. There should be reduction in the manner with which the students consume sugar generally, especially artificial sugar.
2. Unwholesome foods such as biscuits rich in sugar including soft drinks should be avoided.
3. Both senior and junior classes (students) especially the senior class should reduce its sugar intake even if they can afford the products via the sources.

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