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Effect of Health Educational Intervention on Knowledge and Perceptions of Health Consequences of Obesity among Secondary School Students in Ile Ife, Osun, Nigeria

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Abstract

Obesity prevalence among adolescents in the world is on an alarming rate. Obesity is associated with morbidities such as cardiovascular, gastrointestinal, respiratory, cancers, psychosocial and endocrine problems and mortality in significant manner the focus is now on prevention through health educational intervention. This study aimed at assessing the effect of this health education intervention on knowledge and perceptions of health consequences of obesity among secondary school students in Ile Ife, South Western, Nigeria. The study design is quasi experimental which made used of 65 items pre-tested, purpose design, self-administered questionnaire to obtain information on knowledge and perception of health consequences of obesity from the respondents before and after intervention. Data collected were analyzed with descriptive and inferential statistics. The result revealed that knowledge and perception level were low among the selected secondary school students. The results also showed significant difference in the pre-test and posttest knowledge and perception levels of health consequences of obesity among the secondary school students following health educational intervention in the intervention group. The result further showed a significant change overtime, 0 week, 3 weeks and 6 weeks in knowledge and perception of health consequences of obesity in the intervention group. It was therefore concluded that, health educational intervention has positive, significant effect on knowledge and perception of health consequences of obesity among selected secondary school students in Ile Ife, South –west, Nigeria.

Keywords: *Obesity, health education, intervention, knowledge and perception.*

Introduction

The epidemic of obesity is a major challenge to chronic disease, health and disease prevention and serves as a major health hazard today. Over a third of the world's population is affected with obesity and overweight. It is estimated that, by 2030, around 38% of the adult population in the world will be overweight and 20% obese (Flegal et al, 2010; Rudolf et al, 2001; Ng et al, 2013; Stevens et al, 2012). This medical complex involves factors such as genetics, environmental, social and behaviors. These factors play major role in determining an individual's weight.

Modifiable factors associated with obesity are physical activities, dietary intakes and sedentary behaviors. Non-modifiable factors are birth weight, ethnic origin and genetic variation (Hu et al, 2018). There is global increase in prevalence. (Aronne et al, 2009). An estimate of 86.3% of Americans may be obese or overweight 2030. In 2015, globally obesity account for 4 million deaths and about 600 million adults were obese (Gadde et al, 2018; Zhang et al 2014). Obesity prevalence in China is said to parallel that of the United State (Geneen et al, 2011). Obesity is seen as a major threat to public health with its prevalence on an alarming rate. The risks posed by obesity are cardiovascular, gastrointestinal, respiratory, psychosocial and endocrine problems, diabetes, heart disease, depression, premature death and many cancers (Hu and Hruby 2015; WHO 2018; Puepet et al, 2002; Zhang et al, 2014; Flegal et al, 2010; Awan et al, 2014). Obesity prevalence in young people is said to increase the lifetime

cardiovascular risk. Adolescent obesity is on the increase and their knowledge about good lifestyle and obesity health related disease is very poor as well as their knowledge about its prevention.

Shabana and Vijay (2009) suggested that planning interventions that are school based can help prevent childhood obesity which can help increase the level of awareness of its health consequences. This can equally help to prevent, control and reduce obesity/overweight. (Duaa Hefni, 2017). Health education when well utilized can cause a change in lifestyle and risk factors of a disease. Methods of preventing/raising awareness on the risks associated with obesity includes forum, lectures, technical meetings, seminars, conferences, educational meetings, small and individualized training sessions health promoting schools (HPS), school health guidelines, community guide as well as clinical guidelines (WHO 2012; CDC 2018). School based education on health lifestyle and weight reduction as a means of intervention showed significant difference in elementary school students' interventional study as reported by Haghani et al (2017). Understanding the knowledge gaps and perceptions of obesity are paramount to inform and lead to the development of appropriate targeted health education and promotion campaigns to prevent obesity and its complications among the population at risk.

School based education on health lifestyle and weight reduction as a means of intervention showed significant difference in elementary school students in an interventional study reported by Haghani et al (2017). Health promoting school frame work was also found as a means of education to be successful in working on obesity and overweight among students in schools as reported by Langford et al, (2015). Nianogo and Arah (2018) reported that continue intervention of health intervention throughout a life span in addition to other interventions can help reduce obesity epidemics. Many works on interventions in schools and in worksites aim to achieve and maintain healthy weight. Health education sometimes taken to schools inform of HPS with the aid of educating students as well as teachers on practicability of nutrition and physical activity on weight

To the best of my knowledge and through extensive review of literature, there is no study conducted to evaluate the impact of health educational intervention on knowledge and perceptions of health consequences of obesity among secondary school students in Ile Ife, Osun state, Nigeria. This study is therefore a maiden study, directed to assess the impact of health educational intervention on knowledge and perception of health consequences of obesity among secondary school students in Ile Ife, south western, Nigeria. The outcome of this study could reveal any gap in the knowledge and perceptions of health consequences of obesity among secondary school students in Ile- Ife, Nigeria. The study could also reveal the effect of health education on their knowledge and perceptions about obesity. The outcome of the study could also be helpful in identifying the predictors of knowledge and perception of obesity among the secondary school students in Ile- Ife, Nigeria. Information obtained from this study could also be used by health professionals to implement health prevention programmes relating to obesity. Furthermore, the data collected in the course of the research could serve as baseline for further studies. The questions now are: Will there be a difference in the pre-test and post test scores of knowledge and perception of health consequences of obesity following health education in the intervention group and that of control with health education. Does knowledge and perception of health consequences of obesity change over time among secondary school students following health education intervention and without control? The objectives were:

a) To assess level of knowledge of health consequences of obesity and effect of obesity health education programme among secondary school students in Ile Ife, Osun state, Nigeria.
b) Assess level of perceptions of health consequences of obesity and effect of obesity health education programme among secondary school students in Ile Ife, Osun state, Nigeria.
c) Assess socio-demographic variables associated with knowledge and perception of health consequences of obesity among the secondary school students in Ile Ife, Osun state, Nigeria.
d) To assess the effect of health educational intervention on knowledge and perception of

health consequences of obesity over a period of time among secondary school students.

Methods

Research design, study area and population

The study was a quasi-experimental in its design. The study areas were selected secondary schools in Ife East Local Government Area as the intervention group and Ife North Local Government Area as the control group. Ile Ife is a well-known ancient land of the Yoruba, located in Osun state, South-western Nigeria. Four local government areas are associated with this city. They are Ife East, Ife Central, Ife South and Ife North Local government areas. The population studied consisted of secondary school students' girls and boys in the three junior and three secondary school classes (JSS 1-3 and SSS 1-3) from the various selected schools.

Ethical consideration

Ethical approval was obtained from the Obafemi Awolowo University Teaching Hospital Ethics and Research Committee (Protocol number ERC/2020/01/10, International number IRB/IEC/0004553, and n National registration number NHREC/27/02/2009a). Permission was obtained from the State Ministry of Education Zonal Office, school principals and informed consent sought from the students.

Sample size determination

Sample size for the study is calculated using the formula for comparative study (Ibrahim, 2009),

$N=[(Z\alpha+Z\beta) \times 2pq]/d^2$.

There were 120 students per group.

Sampling method

The sampling technique used was a multistage sampling technique.

The first stage involved selection of the intervention study site and the control study site from four local government areas in Ile Ife, Osun, Nigeria. Two local governments were selected out of the four using simple random sampling and are Ife East and Ife North local government areas. The second stage was the selection of 4 wards from the wards in each local government study site (Ife east has 10 wards and Ife North has 10 wards) using sample of convenience technique. The third stage was the selection of a school from each ward making a total of four schools from each study site by simple random technique. The last stage consisted of selection of at least 30 students from each school to make a total of 120 secondary school students as research participants each for control and intervention (health education), based on the study criteria using purposive sampling technique.

Data collection: Being a quasi- experimental study, the first data collection was the pre-test (baseline) data. This baseline data was collected from both the intervention and the control groups in the first week. Health education was given to the intervention group across the four selected secondary schools after a week following which questionnaire was administered. Same questionnaire was then re administered at 3 and 6 weeks respectively, in Ife East Local Government Area. At 6^{th} questionnaire was re administered to the control group.

Data Analysis: The survey data were managed using the Statistical Package of Social Sciences (SPSS) version 17. The descriptive and inferential statistics were utilized. Results were presented using Means, percentages, and standard deviations (SD). Paired t test, one-way ANOVA one-way ANOVA repeated measures tests were utilized.

Results

Ninety-one (91) participants completed the study in the intervention group (76%) completion rate and 112 participants completed the study in the Control group (a 93% completion rate).

Demographic characteristics of the respondents

The sample was made up of secondary school students (n=203) and table one shows this distribution. There were more female respondents (56.65%) in both the intervention and control group. Largest percentage of the respondents (57.63%) was in the13-16 year's age group. Three classes (JSSI, JSS3, SSSI) has had most respondents having thirty-five respondents each. Christians form the largest (80.78%) as seen in the table and Yoruba tribe had were more than others (94.08%). About

(62.07%) of the respondents have heard about obesity before and majorly the source of their information was from the secondary school constituting about (39.9%).

Table 1. Descriptive Characteristics of the Participants

Variables	**Study Groups**				
	Intervention group N=9 (%)		**Control group N=112 (%)**		**Total**
Age:					
9-12	36	39.6	24	21.4	60
13-16	51	56.0	66	58.9	117
17-20	4	4.4	21	18.8	25
>20	0	0.0	1	0.9	1
Gender:					
Male	35	38.5	53	47.3	88
female	56	61.5	59	52.7	115
Class					
JSS1	17	18.7	18	16.1	35
JSS2	14	15.4	18	16.1	32
JSS3	15	16.5	20	17.8	35
SSS1	15	16.5	20	17.8	35
SSS2	16	17.6	18	16.1	34
SSS3	14	5.4	18	16.1	32
Religion					
Christianity	83	91.2	81	72.3	164
Islam	8	8.8	28	25.0	36
others	0	0.0	3	2.7	3
Ethnicity					
Yoruba	84	92.3	107	95.5	191
Igbo	6	6.6	2	1.8	8
Hausa	0	0.0	0	0.0	0
others	1	1.1	3	2.7	4
Have you heard about obesity before?					
Yes					126
No	67	73.6	59	52.7	77
	24	26.4	53	47.3	
What is your source of information					
Primary school					17
Secondary school	9	9.9	8	7.1	81
Relations and family	43	47.3	38	33.9	5
Friends	4	4.4	1	0.9	9
Newspapers/magazines	4	4.4	5	4.5	8
Doctors/health professionals	5	5.5	3	2.7	4
Those that picked no response and still picked a source of information	2	2.2	2	1.8	
	24	26.4	55	49.1	79

Knowledge test results

Table 2 showed the Paired t test result for the pre and posttest knowledge scores for the intervention and the control groups. There was an increase of 25.05 in the mean level of knowledge between the pretest and the post test for the intervention group. This indicated a 48.56% which was statistically significant (t (90) = -11.274, p= 0.000). There was a decrease of 0.32 in the mean knowledge level in the control group between the pretest and post test, which indicated a 0.60% that was no statistically significant (t (111) =0.224, p= 0.823).

Table 2. Comparisons of changes in knowledge scores in the intervention and control groups

Group	N	Pre-test Mean ± SD	Post –test Mean ± SD	t	df	P
Intervention	91	51.58 ±17.06	76.63 ±14.84	-11.274	90	0.000*
Control	112	53.09 ±16.51	52.77 ±16.24	0.224	111	0.823

*showed significant difference at α =0.05.

Perception test results

Table 3 showed the paired t test result of perception between the pre and post test for the intervention and the control groups. An increase of 19.5 was observed in the mean level of perception which represents 38.07% increase which was statistically significant (t (90) = -9.835, p= 0.000). A slight increase of 1.79 was observed which was a 3.2% increase in perception level, but was not statistically significant (t (111) = -1.343, p= 0.182).

Table 3. Comparisons of changes in perception scores in the intervention and control groups

Group	N	Pre-test Mean ± SD	Post –test Mean ± SD	t	f	P
Intervention	91	51.22 ±16.16	70.72 ±15.11	-9.835	90	0.000*
Control	112	55.26 ±13.17	57.05 ±12.77	-1.343	111	0.182

*showed significant difference at α =0.05

Repeated measures knowledge levels for the intervention and control groups

Table 4 shows that the respondents in the intervention group was found to improve over time. The Mauchly's test of Sphericity result was significant (X^2 (2) = 51.468, p= 0.000). Repeated measures ANOVA over time (F (2.177, 195.918) =74.191, P = 0.000*). Figure 1 shows line graph which shows the un weighted means of knowledge for intervention group which was calculated to for the effect of the variables. Table 5 showed that the respondents in the control group had higher knowledge level pretest as compared to post test scores at six weeks. Repeated measures ANOVA over time (F (1, 111) = 0.050, p = 0.823). Figure 2 shows for the control group the un weighted means of knowledge calculated for the to control for the other variables. The line graph showed a decrease at posttest level of knowledge as compared to the pretest values.

Table 4. Repeated knowledge Statistics for Intervention group

Knowledge test scores	N	Mean ± SD
Pre -test	91	51.58 ± 17.06
Post –test 1	91	76.63 ± 14.84
Post –test 2	91	73.63 ± 17.04
Post –test 3	91	74.32 ± 17.05

Greenhouse-Geisser F (2.177, 195.918) =74.191, P = 0.000*

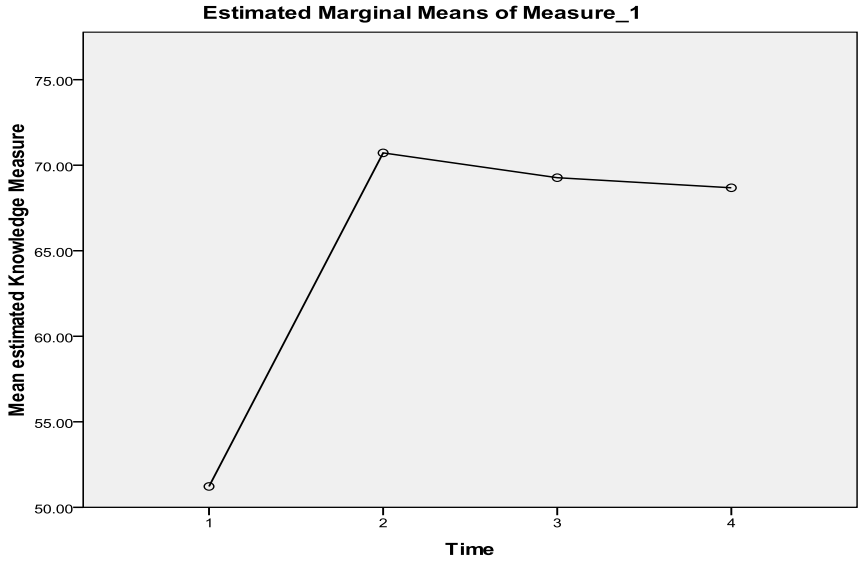

Figure 1. Mean plot of knowledge scores over time (pre-test-post-test 3) for the intervention group

Table 5. Repeated knowledge statistics for Control group

Knowledge test scores	N	Mean ± SD
Pre-test	112	53.09 ±16.51
Post-test	112	52.77 ± 16.24

Greenhouse-Geisser F (1.000, 111.000) = 0.050, P=0.823

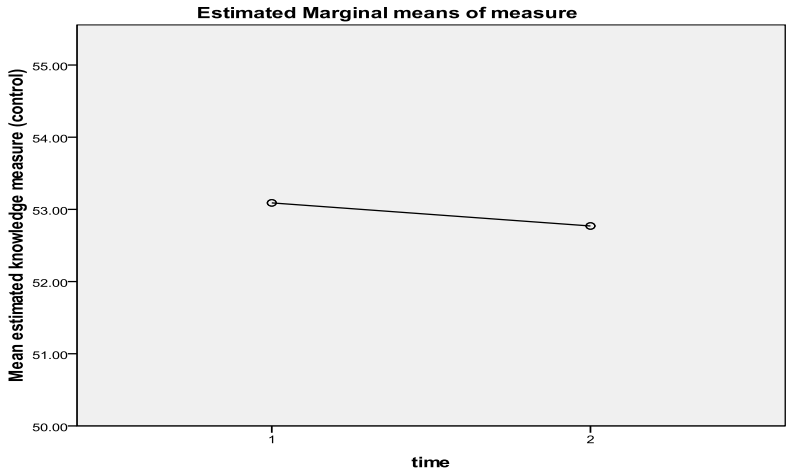

Figure 2. Mean plot of knowledge scores over time (pre-test to post-test) for the control group

Repeated measures perception levels for the intervention and control groups

Table 6 shows that the respondents' perception level improved overtime in the intervention group. The Mauchly's test results were significant (X^2 (2) =24.986, p= 0.000). Figure 3 shows the line graph for the unweighted means of perception of the intervention group being calculated to control for effects of the other variables. Table 7 showed that the respondents of the control group had a slight increase in their perception level at posttest (6 weeks). The repeated measures ANOVA, showed that the perception level of the respondent's overtime was affected in the control group but not statistically significant (F (1.000, 111.000) = 1.805, p=0.182). Figure 4 is the line graph of the un weighted meansof perception of the control group. The plotted graph showed that the perception level of the

respondents in the control group slightly increased at posttest.

Table 6. Repeated perceptions statistics for Intervention Group

Perceptions test scores	N	Mean ± SD
Pre- test	91	51.22 ± 16.16
Post-test	91	70.72 ± 15.12
Post-test 2	91	69.27 ± 13.63
Post-test 3	91	68.68 ± 15.06

Greenhouse –Geisser, F (2.554, 229.876) = 60.801, p = 0.000.

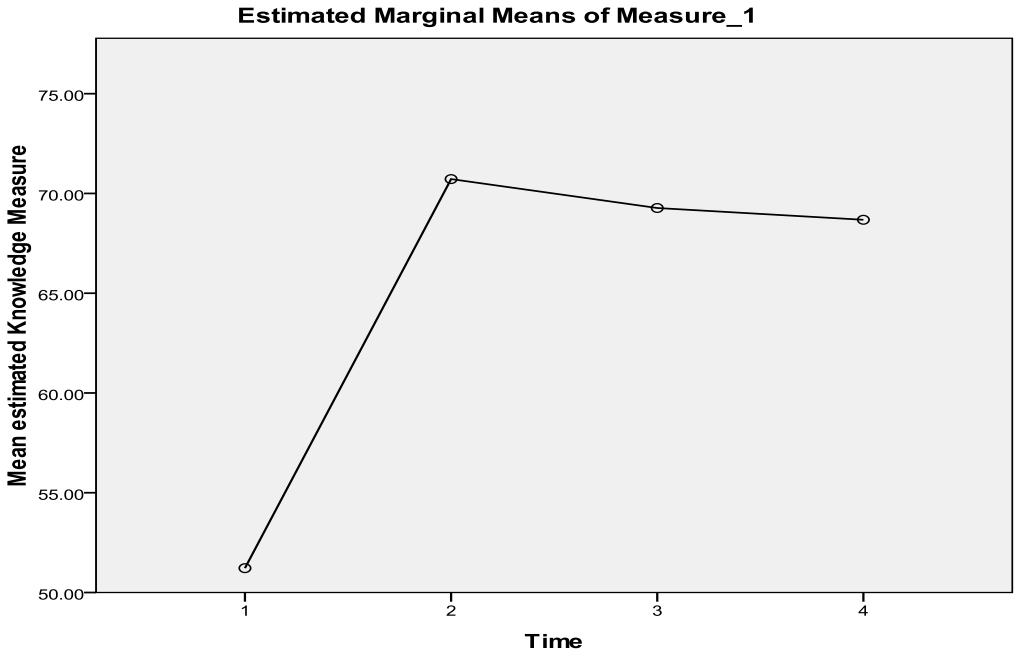

Figure 3. Mean plot of perception scores over time (pre-test to post-test 3) for the intervention group

Table 7. Repeated perceptions statistics for Control group

Perceptions test scores	N	Mean ±SD
Pre -test	112	55.26 ±13.17
Post -test	112	57.05 ±12.77

Greenhouse- Geisser F (1.000, 111.000) = 1.805, p=0.182.

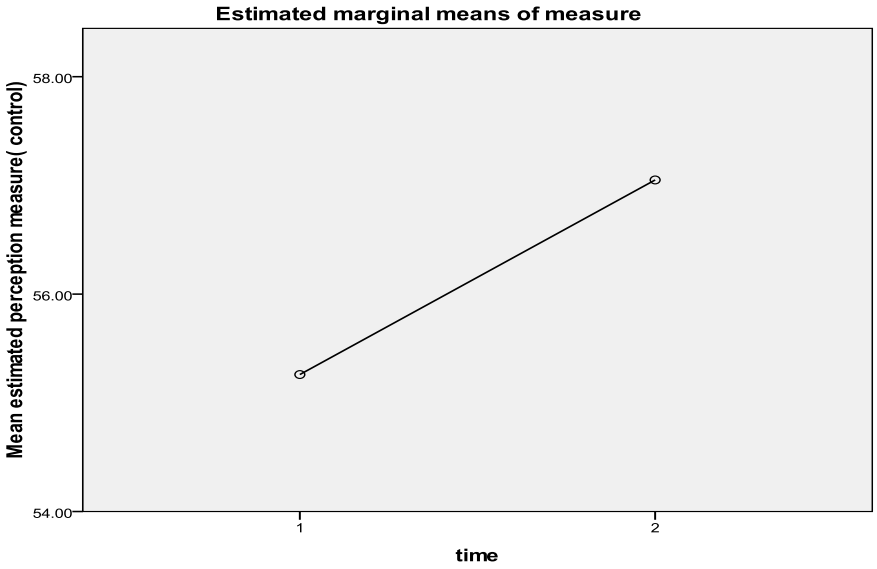

Figure 4. Mean plot of perception scores over time (pre-test to post-test) for the control group

Table 8 shows the association between socio-demographic variables and pretest knowledge and pretest perception in the intervention group. The result showed that only class of the respondents was statistically significantly associated with pre knowledge (F (5,85) = 4.289, p=0.002). table 9 showed the association between socio-demographic variables and posttest knowledge and posttest perception in the intervention group. The result showed that only class of the respondents was statistically significantly associated with post knowledge (F (5,85) =3.491, p= 0.006) and post perception (F (5,85) =5.996, p=0.000).

Table 8. Association between socio- demographic variables and pre-test knowledge and pretest perception in the Intervention group

Socio-demographic variable	**N (%)**	**Pre-test knowledge Intervention Mean ± SD**	**Pre-test perception Intervention Mean SD**
Gender			
Male	35	49.43 17.14	52.24 15.67
Female	56	52.92 17.03	50.57 16.57
		t=-0.948, p=0.346	t= -0.478, p=0.634
Age group(years)			
9-12	36	54.54 17.69	51.98 16.85
13-16	51	50.78 16.16	51.89 14.57
17-20	4	35.00 15.75	35.71 25.42
		F (2,88) = 2.571, p= 0.082	F (2, 88) = 1.967, p= 0.146
Class level			
JSS1	17	56.67 12.58	40.01 12.49
JSS2	14	61.43 14.78	55.87 10.72
JSS3	15	50.00 18.73	53.09 14.59
SSS1	15	52.89 11.67	54.76 21.67
SSS2	16	51.46 16.10	56.25 12.34
SSS3	14	35.58 19.31	41.33 19.39
		F (5,85) = 4.289, p=0.002*	F (5,85) = 2.281, p=0.054
Religion			
Christianity	83	52.33 17.44	51.51. 16.44
Islam	8	43.75 10.15	48.21 13.36
		t=1.365, p=0.176	t=0.548, p=0.585

Ethnic group Yoruba Igbo	 84 6	 51.91 17.59 46.11 7.72 t=0.798, p=0.427	 51.70 15.71 43.45 22.75 t= 1.205, p= 0.231
Have you heard about obesity before? Yes No	 67 24	 51.19 16.15 52.64 19.73 t= -0.354, p= 0.724	 52.56 15.96 47.47 16.47 t= 1.329, p= 0.187
BMI Under nutrition Normal Overweight	 51 39 1	 53.39 16.16 48.97 17.71 60.00 F (2,88) = 0.863, p = 0.425	 52.24 13.11 49.63 19.64 60.71 F (2,88) = 0.457, p = 0.635

*Significant at $\alpha < 0.05$

Table 9. Association between socio- demographic variables and pre-test knowledge and perception in the Intervention group

Socio-demographic variable	**N (%)**	**Post test knowledge Intervention Mean (SD)**	**Post- test perceptions Intervention Mean (SD)**
Gender Male Female	 35 56	 77.05 12.62 76.37 16.18 t= 0.833, p= 0.211	 70.41 14.82 70.92 15.43 t= -156, p=0.877
Age group (Years) 9- 12 13- 16 17- 20	 36 51 4	 74.07 14.08 78.17 15.45 80.00 13.61 F (2,88)=0.909, p=0.407	 66.47 15.66 73.25 14.66 76.79 6.19 F(2, 88)= 2.544, p=0.084
Class Level JSS 1 JSS 2 JSS 3 SSS 1 SSS 2 SSS 3	 17 14 15 15 16 14	 60.71 16.20 80.95 11.58 78.00 17.22 82.89 10.68 76.25 12.04 79.05 14.10 F (5, 85) = 3.491, p= 0.006*	 56.51 15.83 68.62 11.90 70.24 16.24 78.09 11.28 78.13 8.44 74.23 14.70 F (5, 85) = 5.996, p=0.000*
Religion Christianity Islam	 83 8	 77.03 14.56 72.50 18.15 t= 0.822, p= 0.413	 71.30 14.82 64.73 18.05 t= 1.176, p= 0.243
Ethnic Group Yoruba Igbo	 84 6	 76.91 15.15 71.67 10.90 t= 0.830, p=0.409	 71.34 15.06 65.48 14.93 t=0.922, p= 0.359
Have you heard about obesity before? Yes No	 67 24	 75.62 15.75 79.44 11.78	 71.11 15.69 69.64 13.65

		t= -1.083, p=0.282	
BMI			
Under nutrition	51	74.64 15.74	69.61 14.66
Normal	39	79.32 13.53	71.98 15.92
overweight	1	73.33	78.57
		F(2,88)=1.124, p=0.330	F(2,88)=0.403, p=0.670

*Significant at $\alpha < 0.05$

Discussion

This study was conducted to determine the effect of health educational intervention programme on knowledge and perception of health consequences of obesity among secondary school students in Ile Ife, Nigeria. There were more female respondents than male. There seems to be increase in girl child education and seems given utmost priority among the study population. The result showed higher Christian respondents. Yoruba participants were more than other tribes. The result can be explained by the fact the sampled study population shows the dominant religion being practiced in the communities and they are located in Yoruba land.

The result of this study showed that there was significant difference in the pre-test and post-test knowledge scores of the secondary school students in the intervention group following health education programme intervention. Their knowledge score increased from 51.58 to 76.63 that is a 48.57% increase. The result of this study is in agreement with a similar study by Seyed et al (2017), Noorbakhsh et al (2017), Alizadeh et al (2013), Moradi et al (2013), Blasingame (2017), Shah et al (2016) and Mohammad et al (2013). There was also a significant difference between the pre-test and post-test perceptions scores of the secondary school students in the intervention group following health education programme. Their perception score increased from 51.22 to 70.72 which represents a 38.07% increase. There was a significant difference between the pre-test and post-test perceptions scores of the secondary school students in the intervention group following health education programme. Their perception score increased from 51.22 to 70.72 which represents a 38.07% increase. There was a significant difference between the pre-test and post-test perceptions scores of the secondary school students in the intervention group following health education programme. There was a significant difference between the pre-test and post-test perceptions scores of the secondary school students in the intervention group following health education programme. Their perception score increased from 51.22 to 70.72 which represents a 38.07% increase. The result of this study is in agreement with the work of Yetgin et al (2019) and Amir et al (2011). There was no significant difference in the participants' pre-test and post-test scores in the control group.

Therefore, the improvement in knowledge and perception of health consequences of obesity obtained from this study could be attributed to the effect of health education administered on the secondary school students in the intervention group. This reflects the quality of the health education given.

The knowledge and perception levels of the secondary school students in the intervention group were affected overtime. The results showed that there was a significant change in knowledge and perception overtime for the participants in the intervention group, over a period of 0 week, 3 weeks and over a period of 6 weeks. This outcome was supported by close related study conducted among high school adolescents using adolescent. Haghani et al (2017), Reinehr et al (2017), Amir et al (2011) Jiang et al (2007) and Kafatos et al (2005). This study revealed that pre and post health education intervention, only class factor of the demographic variables was significantly associated with knowledge of the participants. (Oyewande et al (2019), Mangalathil et al (2014) (Oh et al (2011), Hajian-Tilaki and Heidari (2009)). Lamerz et al (2005)) and in variance with El Kishawi et al (2014), at variance with others (Arilewola (2017).

Conclusion

The aim of this study was to measure the effect of health educational intervention on the knowledge and perceptions of health consequences of obesity among secondary school students in Ile- Ife, Osun State. The

outcome of this study also reveals that there is significant difference between the pre- and post-test obesity knowledge scores (which increased from 51.58 to 76.63) and perceptions scores (which increased from 51.22 to 70.72) in the intervention group following health education intervention. The study also shows a significant improvement in knowledge and perceptions of health consequences of obesity overtime for the participants in the intervention group. The study further showed that there was association class, knowledge and perception. This study has further established that health educational intervention in any of its form has positive, significant effect on knowledge and perceptions of health consequences of obesity among secondary school students in Ile Ife, South West, Nigeria.

Recommendation

Based on the results seen in this study, the following recommendations are made

1. The need to involve, school authority in the intervention programme to make it more effective by inculcating physical activities and nutrition to make lasting effect and put into practical use the necessary knowledge gained.
2. Involving mass media in the propagating of the educative information to the masses to inculcate in them the preventive behavior and safe lifestyle.
3. The need to carry out the research in many local governments/provinces and longer duration such as 12 weeks, 6 months and in years.

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