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Socio-Demographic Characteristics of Secondary School Students and their Knowledge and Perceptions of Asthma in Ile Ife, South- West, Nigeria

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Abstract

Poor understanding of asthma can result in under- utilisation of available health services and reduced adherence to medications which ultimately leads to poorly controlled asthma and negatively impacts quality of life. Studies of association between asthma knowledge and asthma perceptions with socio-demographic variables (such as age, class level, ethnicity, religion, familial experiences) with and without health education intervention in Nigeria are sparse. The study identifies socio- demographic factors associated with knowledge and perceptions of asthma at the pre- test and post- test health education intervention among the secondary school students of Ile- Ife, Osun State, and South-West, Nigeria. It is a quasi- experimental design study which used a pre-tested 71- item, purpose designed, self-administered questionnaire to collect information on socio-demographic variables, knowledge and perceptions of the respondents on asthma before and after intervention. Data was collated and analyzed using appropriate descriptive and inferential study design. The results of this study showed that there were significant associations between posttest knowledge and variables of class level and religion. Another finding was that ethnicity showed a significant association between pretest perception score of the participants. It also showed there was a significant association between posttest perceptions and class level of the participants. We concluded that health education intervention influenced the association between certain socio- demographic variables (such as class level, religion and ethnicity) deployed in this study and the knowledge and perceptions of asthma among secondary school students in Ile- Ife, South-West, Nigeria.

Keywords*: Asthma; Knowledge; Perceptions; Socio-Demographic variables.*

Introduction

The burden of asthma is challenging worldwide. It is now estimated that over 330 million people of all ages, and all ethnic backgrounds, suffer from asthma and the burden of this disease to governments, health care systems, families, and patients is increasing worldwide (Marsden et al, 2016; Maspero et al, 2013; Vos et al, 2013). Asthma prevalence within a population generally varies between 1 %–18 % for children and adults, with great heterogeneity between countries (GINA, 2010). Some studies related to the prevalence of asthma in Nigeria among children showed an increase from 10.7% to about 20% between 1999 and 2014 (Asher et al, 2014). The burden of asthma remains significantly high, and patients' perception of control is not in agreement with actual level of asthma severity and symptoms (Maspero et al, 2013). Little is known about the public's perception of asthma as a disease. In other populations, such studies have shown that parents of children with asthma and individuals suffering from asthma may have

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poor knowledge or misconceptions about asthma and its treatment (Marsden et al, 2016; Maspero et al, 2013). Common misconceptions in these studies included the idea that asthma is contagious, that it can be cured, that inhalers are either addictive or are not good treatment, that herbs play a role in asthma treatment and that asthma limits exercise (Evers et al, 2013; Zaraket et al, 2011; Malone et al, 2008; Smeeton et al, 2007; Shivbalan et al, 2005).

Assessing personal beliefs about illnesses can help to explain and predict preventive and therapeutic coping strategies as well as adjustment to a disease and health outcomes (Del Castillo et al, 2013). People create emotional and cognitive schema of the illnesses based on their health status and this can determine their perception of the illness. These emotional and cognitive schemas of illnesses are derived from several informational sources, including: 1) an individual's knowledge and direct experiences; 2) socio-cultural knowledge; and 3) information and experiences from significant others (e.g., relatives, physicians) [Leventhal et al, 1991; Leventhal et al, 1980]. Also, the relationship between symptom perception and triggers are influenced by age, asthma duration, race, asthma control, and socioeconomic status (SES) [Wood et al, 2007; Yoos et al, 2003]. Previous studies that assessed perception, knowledge, and attitudes related to asthma reported that the level of knowledge and perceptions of asthma is low and that age and class level of the students showed a significant association between asthma knowledge and perceptions (Ilesanmi et al, 2017; Neffen et al, 2005). The complications of asthma could be influenced by poor knowledge, poor use of inhaler technique, non-compliance and negative attitude toward the illness, those that have the illness and the drugs (Oluwole et al, 2017; Marsden et al, 2016; Anwar et al, 2008). Poor understanding of the disease can result in under- utilisation of available health services and reduced adherence to medication (Ponieman et al, 2009; Zaman et al, 2006). Ultimately this leads to poorly controlled asthma and negatively impacts quality of life (Marsden et al, 2016). Education and awareness about asthma through strategies such as health education intervention will help improve disease management, reduce stigmatization and work towards decreasing society burden of the disease (Marsden et al, 2016). It has been suggested that education of health care providers and the public is a vital element of the response to the challenge posed by asthma (Braman, 2006; Ndiaye et al, 2004). Studies have also shown that health education can enhance knowledge, and change attitudes and behaviours (Daboer et al, 2008). Health education is any combination of learning experiences designed to help individuals and communities improve their health by increasing their knowledge or influencing their attitude (WHO, 2013). Knowledge is defined as the expertise and skills acquired by a person through experience or education with the ability to use it for a particular purpose (Sharda, & Shetty, 2008). Illness perceptions are the cognitive representations or beliefs that patients or a healthy individual have about illnesses and medical conditions such as asthma (Katavic et al, 2016). Perception is the elaboration, interpretation and assignment of meaning to a sensory experience (Promtussananon, 2003).

Significance of study

Although a few extant reports have examined perception, knowledge, and attitudes related to asthma, there are limited research findings on socio- demographic factors associated with knowledge and perceptions of asthma among secondary school students in Nigeria. Thus, this study therefore is directed to investigate the association between some socio- demographic factors of secondary school students in Ile- Ife, South-West, Nigeria and their knowledge and perceptions of asthma before and after a health education intervention. The outcome of the study could be helpful in identifying the predictors of knowledge and perception of asthma 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 asthma. Furthermore, the data collected in the course of the research could serve as baseline for further studies.

Statement of problem

Studies indicate that asthma is not just a public health problem for high income countries but is increasingly becoming widespread in the developing world with most asthma related deaths occurring in

low and lower-middle income countries including Sub-Saharan Africa (WHO, 2008; Asher et al, 2006). Some studies have also shown that relatives of those with asthma and individuals suffering from asthma may have poor knowledge or misconceptions about asthma and its treatment ((Evers et al, 2013; Zaraket et al, 2011). Adolescents with asthma are at higher risk of serious disease complications due to under-appreciation and denial of their disease severity, non-adherence with medications and trigger avoidance, and other risk-taking behaviours such as smoking tobacco or marijuana and using cocaine (Guo et al, 2010; Towns et al, 2009; Bender, 2007). However, there is expanding empirical support for the assertion that perceptions regarding asthma and its treatment are important influences on outcomes (Kaptein et al, 2008). Studies have also shown that the range of social and psychological factors found to either influence, or be associated with asthma perception and knowledge includes age, gender, Body Mass Index (BMI), level of education, history of exercise-induced symptoms, and psychological state (Chen et al, 2006; Ilesanmi et al, 2017). However, most of these studies have come from developed countries without considering the impact of health educational intervention and the association of some of these socio-demographic variables with both knowledge and perceptions of asthma especially among high school students. Schools have been identified as the prime settings for asthma health education for children and adolescents due to practicality, familiarity with the environment and the magnitude of influence that peers equipped with knowledge exert on themselves which has the potential to reduce morbidity outcomes in asthma (Valeros et al, 2001; Thies et al, 2001). Therefore, this study was aimed at investigating the association between their asthma knowledge and perceptions levels and certain socio- demographic characteristics of the secondary school students in Ile- Ife, South- West, Nigeria, before and after administering health education intervention.

Research questions

The major research questions for this study included the following:

1. What effect does the socio-demographic factor (gender, age group, class level, religion, ethnicity and family experience) have on secondary school students' knowledge (intervention group) pre-test scores?
2. What effect does the socio-demographic factor (gender, age group, class level, religion, ethnicity and family experience) have on secondary school students' perceptions (intervention group) pre-test scores?
3. What effect does the socio-demographic factor (gender, age group, class level, religion, ethnicity and family experience) have on secondary school students' knowledge (intervention group) post-test scores?
4. What effect does the socio-demographic factor (gender, age group, class level, religion, ethnicity and family experience) have on secondary school students' perceptions (intervention group) post-test scores?

Research objectives

1. Identify Socio-demographic factors associated with knowledge of asthma at the pre- test and post-test health education intervention among the secondary school students of Ile- Ife, Osun State, South-West, Nigeria.
2. Identify Socio- demographic factors associated with perceptions of asthma at the pre- test and post-test health education intervention among the secondary school students of Ile- Ife, Osun State, South-West, Nigeria.

Hypotheses

The following null hypotheses were tested in this study:

1. H_0: There would be no significant association between socio- demographic factors (gender, age group, class level, religion, ethnicity, family experience (have a relative with asthma) and family

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experience (have lived with or known someone with asthma)) and pre- intervention knowledge scores.

2. H_0: There would be no significant association between socio- demographic factors (gender, age group, class level, religion, ethnicity, family experience (have a relative with asthma) and family experience (have lived with or known someone with asthma)) and pre- intervention perception scores.
3. H0: There would be no significant association between socio- demographic factors (gender, age group, class level, religion, ethnicity, family experience (have a relative with asthma) and family experience (have lived with or known someone with asthma)) and post- intervention knowledge scores.
4. H0: There would be no significant association between socio- demographic factors (gender, age group, class level, religion, ethnicity, family experience (have a relative with asthma) and family experience (have lived with or known someone with asthma)) and post- intervention perception scores. Level of significance was set at $\alpha < 0.05$.

Inclusion criteria

Participants were students aged 9 to 19 years in the selected schools in Ile- Ife whom the parents or guardian gave an informed consent. In addition, they must have no prior diagnosis of asthma by a Physician and must not be on any asthma medications.

Exclusion criteria

Any students with asthma and or on treatment for asthma and those students whose parents or guardian failed to give informed consent were excluded from the study.

Methods

Research design, study area and population

This quasi-experimental study was conducted among secondary school students in Ile-Ife, Osun state, South-West Nigeria from September to December 2017 of the 2017/ 2018 academic year. The study areas were selected secondary schools in Ife Central Local Government Area as the intervention group and selected secondary schools in Ife North Local Government Area as the control group. Ile-Ife is an ancient city of Yoruba land situated in Osun State which is located in the South- Western part of Nigeria. There are four local governments which are affiliated with this city. They include Ife Central, Ife East, Ife North and Ife South Local Government Areas. The study population consisted of the secondary school students' boys and girls in the junior secondary school one, two and three (JSS1, JSS 2 and JSS 3) and senior secondary school one, two and three (SSS1, SSS2 and SSS3) of the selected schools.

Ethical consideration

Ethical approval to conduct the study was gotten from the Obafemi Awolowo University Teaching Hospital Ethics and Research Committee (Protocol number ERC/ 2017/08/14; International registration number IRB/IEC/0004553; National registration number NHREC/27/02/2009a). Permission to conduct the study was also sought and obtained from the State Ministry of Education zonal office and the school authority (Principals) of all the schools used for the study. Informed consent was also got from the respondents and their parent(s)/ guardian before proceeding with the study.

Sample size determination

The minimum sample size calculated was **n=117**. To compensate for non- responses misplaced or improperly completed questionnaires and attrition, the calculated sample size was increased by 20% yielding a sample size number of **140**. However, to cater for drop- outs a total of 180 questionnaires were each taken to the Intervention and Control sites.

Sampling method

The sampling technique was a multistage sampling technique. The first stage was the selection of the intervention study site and the control study site from the four local government areas in Ile- Ife, Nigeria. Two local government areas were selected from the four local government areas in Ile Ife using simple random sampling and they are Ife Central and Ife North local government areas. Each of the two local government areas were assigned to either intervention or control group through the process of simple balloting. Ife Central Local Government area was the intervention group while Ife North Local Government area was the control group. The two local government areas are far apart enough to minimize influence of the control group by the intervention group. The second stage consisted of selection of 3 wards from the wards in each local government study site (Ife Central LGA has 11 wards and Ife North LGA has 10 wards) using convenience sampling technique. The third stage was the selection of one school from each ward making a total of three schools from each study site by simple random technique. The last stage consisted of the selection of at least sixty students from each school to make a total of 180 secondary school students as research participants in all for each study group based on the study criteria using purposive sampling technique. One hundred and sixty two (162) participants completed the study in the Intervention group (a 90% completion rate) and 153 participants completed the study in the Control group (an 85% completion rate).

Data collection

Data for this quasi- experimental study was collected using a pre-tested 71- item, purpose designed, self- administered anonymous questionnaire containing closed ended questions to assess the knowledge and perceptions of asthma among these secondary school students in Ile- Ife, South-West, Nigeria. The content validity and content validity index analysis for the two instruments to test the outcomes of knowledge and perceptions (using modified Newcastle Asthma Knowledge Questionnaire (NAKQ) and modified revised Illness Perception Questionnaire (IPQ-R)) were initially verified by the appointment of six panel members who rated the items in the questionnaire. After the content validity processes of the questionnaire, it was then pre-tested among thirty secondary school students in a school in Ife East local government area with a view to detecting deficiencies or ambiguities in the questionnaires, making appropriate corrections and finding its reliability among the study population. The questionnaire takes approximately 25 minutes to complete. The Cronbach's Alpha for both scales from the pilot testing were measured and revealed high internal consistency values in modified NAKQ (0.627) and adapted modified IPQ-R (0.718) as confirmed by Polit and Beck 2008; Sekaran, 2006. The questionnaire contained three sections. The first section contained10 items focusing on socio-demographic characteristics of the secondary school students. The second section which is a modified Newcastle Asthma Knowledge Questionnaire adapted for the study population is an instrument which consists of 31 questions (31 true/false items/ I don’t know answer) and investigated respondents’ general knowledge of asthma, knowledge of recognition, triggers and management of acute asthma, maintenance treatment and false myths about asthma. The third section which is a modified Revised Illness Perception Questionnaire (IPQ-R) which have been adapted to assess illness perceptions among healthy people (Figueiras and Alves, 2007) is an instrument which consists of 30 questions (30 Yes/No/ Not sure answers) and contained statements regarding asthma perceptions in which the respondents were asked to indicate whether in each case they agree with the statement or not, or they are not sure. Answers were graded by assigning 1 point for the right answers and 0 point for the wrong answers given to the questions on asthma knowledge. Scores regarding asthma knowledge range from 0 to 31. To measure the level of students’ knowledge in percentage, the total score is divided by 31 points and multiplied by 100. Scores regarding perceptions of asthma range from 0 to 30. To measure the level of students’ perceptions in percentage, the total score is divided by 30 points and multiplied by 100. The health education programme was for a period of two weeks. The first data collection was the baseline (pre- test) data. It was collected from the control group and the intervention group. This was collected one week prior to the

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health education intervention which was given to the intervention group. This was followed by delivering of health education programme to the intervention group participants across the 3 selected schools in Ife Central Local Government Area for the period of two weeks. The second data was collected from the intervention group at post- test date (1 week). The third data was collected from the intervention group at post- test date (3 weeks). The fourth data was collected from the intervention group at post- test date (6 weeks) and also from the control group at post- test date (6 weeks) for their second data. This was then followed by delivery of health education programme to the control group participants after the research study had been completed to compensate them. The reasons for selecting these intervals is based on a similar study conducted by Shaw et al, 2005 where the outcomes being tested were measured at the post intervention dates (1, 3 and 6 weeks) in the intervention group and also Social Cognitive Theory which confirmed that observing young person's behavioural change should occur after a short period of time (at least 3 weeks) to assess the point of maximum benefits where learning by observation will be intensified. Over this first three weeks, the students will be assumed to follow the process of learning by observation (attention, retention, and motivation). However, the last assessment post intervention (6 weeks later) was aimed to assess students' ability to retain the acquired learning over a short period of time. The outcomes could still be measured over an extended period of time but this present study was however limited to 1, 3 and 6 weeks post intervention date in the intervention group.

The intervention sessions of health education on asthma which are components of Health Belief Model (HBM) were in form of interactive lectures using Microsoft PowerPoint® presentations with a projector, use of posters, focused group discussions and practical sessions on the use of peak flow meters and inhalers. Modules included Microsoft PowerPoint® lectures (equipped with speaker's notes and formatted on zip disks), activity hand-outs, discussion dialogues, examination with answer keys, case studies, and resource lists. The curriculum for the health education on asthma included provision of adequate information to these students on the general knowledge of asthma aetiology, epidemiology and patho-physiology of asthma, identification of common triggers of asthma and how to control these triggers, types of asthma medications, and asthma management, and exercise and asthma, prognosis of asthma and myths about asthma. Similar to the learning activities in these interventions, components of social cognitive theory (SCT) such as performance accomplishments, vicarious experience, verbal persuasion and emotional arousal were also incorporated into the asthma health education programme to enhance the self-efficacy perceptions of the secondary school students.

Data analysis

The completed questionnaires were collated, analyzed and presented using descriptive statistics. Means, percentages, and standard deviations (SD) were used to describe the distribution of demographics over the study groups (control Vs. intervention). All statistical analyses were performed using the Statistical Product and Service Solutions (SPSS), Version 20.0 (IBM, Armonk, NY, USA). Inferential statistics of one way ANOVA test was used to determine the association between some demographic variables and the knowledge and perception scores over the study duration in the intervention group. Also inferential statistics- the Indepedendent- t tests were also used in some comparisons to determine the association between some socio-demographic variables and the knowledge and perceptions scores in the intervention group over the study duration. Statistical level of significance was set at P- value < 0.05.

Results

Demographic characteristics of the participants

The sample consisted of secondary school students (n=315). Table 1 below shows the distribution of the participants to either the control group (n=153) or the intervention group (n=162). It showed there were more female respondents (53.97%) than male respondents (46.03%). Majority of the respondents (59.05%) were in the 13-16 years age group. Also, Classes SSS 1 and SSS 2 had most respondents with

fifty seven (18.1%) each. Largest percentages of the respondents were Christians (92.06%) as shown by the result. The result also showed that largest percentages of them were Yoruba tribe (93.02%).

Table 1. Demographic characteristics of the participants

Participants' Characteristics	**Groups**		**Total**
	Intervention Group (n= 162) n (%)	**Control Group (n= 153) n (%)**	
Gender			
Male	81 (50.0)	64 (41.8)	145
Female	81 (50.0)	89 (58.2)	170
Age Group			
9- 12	59 (36.4)	35 (22.9)	94
13-16	95 (58.6)	91 (59.5)	186
17-20	8 (4.9)	27 (19.6)	35
Class level			
JSS 1	23 (14.2)	20 (13.1)	43
JSS 2	29 (17.9)	27 (17.6)	56
JSS 3	30 (18.5)	25 (16.3)	55
SSS 1	27 (16.7)	30 (19.6)	57
SSS 2	27 (16.7)	24 (15.7)	51
SSS 3	26 (16.0)	27 (17.6)	53
Religion			
Christianity	151 (93.2)	140 (91.5)	290
Islam	11 (6.8)	12 (7.8)	23
Others	-	1 (0.7)	1
Ethnic Groups			
Yoruba	143 (88.3)	150 (98.0)	293
Igbo	13 (8.0)	1 (0.7)	14
Hausa	1 (0.6)	-	1
Others	5 (3.1)	2 (1.3)	7

Familial experience of the respondents in relation to asthma

The result showed in table 2 below that 42 (13.3%) of the respondents have a relative with asthma. The results also showed that 113 (35.9%) have lived or known someone with asthma. Two hundred and forty (76.2%) of the respondents had heard about asthma before. Television and Radio constituted the largest source of information about asthma accounting for 30.2% of all the responses. These were followed by School (16.8%), with Doctor or Healthcare Practitioner accounted for the least source of Information (6.3%).

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Table 2. Familial experience of the respondents in relation to asthma

Characteristics	Groups		Total
	Intervention Group (n= 162) n (%)	Control Group (n= 153) n (%)	
Family Experience 1 (Have a relative with asthma)			
Yes	24 (14.80)	18 (11.80)	42
No	138 (85.20)	135 (88.20)	273
Family experience 2 (Have lived with or known someone with asthma)			
	74 (45.70)	39 (25.50)	113
Yes	88 (54.30)	114 (74.50)	202
Have you heard about asthma before?			
Yes	145 (89.50)	95 (62.10)	240
No	17 (10.50)	58 (37.90)	75
Where did you hear about asthma?			
School	26 (16.05)	27 (17.65)	53
TV & Radio	41 (25.31)	54 (35.29)	95
Books	13 (8.02)	16 (10.46)	29
Relatives & Family	20 (12.35)	12 (7.84)	32
Friends	17 (10.49)	8 (5.23)	25
Newspaper & Magazine	17 (10.49)	5 (3.27)	22
Doctor/ Healthcare Practitioner	14 (8.64)	6 (3.92)	20
Others	14 (8.64)	25 (16.34)	39

Association between Socio- Demographic Variables and knowledge pre- test and post- test scores in the Intervention Group

Table 3 is the one way ANOVA and Independent t test analyses which shows association between knowledge pretest, post test scores and gender, age group, class level, religion, ethnicity, family experience (have a relative with asthma) and family experience (have lived with or known someone with asthma of the students in the intervention group. The results showed there were significant associations between knowledge posttest and variables of class level and religion.

Table 3. Association between Socio- demographic variables and knowledge pre-test and post- test scores in the Intervention group

Socio-demographic variable	**N (%)**	**Pre- test knowledge mean (SD) Intervention**	**Post- test knowledge mean (SD) Intervention**
Gender			
Male	81 (50.0)	45.01 (15.04)	71.87 (14.10)
Female	81 (50.0)	41.26 (16.24)	72.42 (14.11)
		t (160)= 1.527, p= 0.129	t (160)= -0.250, p= 0.803
Age group (Years)			
9- 12	59 (36.4)	41.41 (18.23)	68.77 (15.50)
13- 16	95 (58.6)	44.48 (14.28)	74.24 (12.96)
17- 20	8 (4.9)	39.92 (11.16)	72.18 (12.06)
		F (2,159)= 0.871, p= 0.420	F (2,159)= 2.811, p= 0.063
Class Level			
JSS 1	23 (14.2)	46.00 (22.44)	63.65 (14.30)
JSS 2	29 (17.9)	42.60 (14.02)	69.97 (15.45)
JSS 3	30 (18.5)	39.36 (15.26)	74.45 (12.29)
SSS 1	27 (16.7)	43.88 (14.08)	68.83 (14.81)
SSS 2	27 (16.7)	42.76 (13.79)	78.95 (9.10)
SSS 3	26 (16.0)	45.16 (14.94)	75.81 (13.51)
		F (5,156)= 0.601, p= 0.699	F (5,156)= 4.297, **p= 0.001***
Religion			
Christianity	151 (93.2)	43.56 (15.52)	72.81 (13.76)
Islam	11 (6.8)	37.24 (17.92)	63.05 (15.69)
		t(160)= 1.291, p= 0.199	t(160)= 2.249, **p= 0.026***
Ethnic Group			
Yoruba	143 (88.3)	43.00 (15.81)	71.65 (14.32)
Igbo	13 (8.0)	45.91 (15.92)	76.18 (12.87)
Hausa	1 (0.6)	48.39	80.65
Others	5 (3.1)	38.71 (15.64)	73.98 (10.13)
		F (3,158)= 0.304, p= 0.823	F (3,158)= 0.561, p= 0.642
Family Experience 1 (Have a relative with asthma)			
Yes	24 (14.8)	44.35 (17.18)	73.59 (13.15)
No	138 (85.2)	42.92 (15.50)	71.89 (14.24)
		t(160) = 0.408, p = 0.684	t (160) = 0.546, p = 0.586

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Family Experience 2 (Have lived with or known someone with asthma)			
Yes	74 (45.7)	42.54 (13.85)	72.65 (13.17)
No	88 (54.3)	43.63 (17.19) t (160) = -0.439, p = 0.662	71.72 (14.83) t (160) = 0.417, p = 0.672

[x] Significant at $\alpha < 0.05$, t = t value, F = ANOVA value, p = level of significance

Association between Socio- Demographic Variables and perceptions pre- test and post- test scores in the Intervention Group

Table 4 is the one way ANOVA and Independent t test analyses which shows association between perceptions pretest, post test scores and gender, age group, class level, religion, ethnicity, family experience (have a relative with asthma) and family experience (have lived with or known someone with asthma of the students in the intervention group. The result showed that only Ethnicity showed a significant association with perceptions pretest score of the participants. It also showed there was a significant association between perceptions posttest and class level of the participants.

Table 4. Association between socio- demographic variables and perceptions pre-test and post- test scores in the Intervention group

Socio-demographic variable	N (%)	Pre- test perceptions mean (SD)	Post- test Perceptions mean (SD)
Gender			
Male	81 (50.0)	52.51 (14.53)	66.79 (15.36)
Female	81 (50.0)	52.92 (67.94) t (160)= -0.053, p= 0.958	68.01 (11.85) t (160)= -0.566, p= 0.572
Age group (Years)			
9- 12	59 (36.4)	47.18 (18.96)	65.54 (13.08)
13- 16	95 (58.6)	56.28 (62.04)	68.62 (14.13)
17- 20	8 (4.9)	51.25 (8.15) F (2,159)= 0.630, p= 0.534	66.67 (12.60) F (2,159)= 0.934, p= 0.395
Class Level			
JSS 1	23 (14.2)	46.09 (18.11)	60.00 (14.80)
JSS 2	29 (17.9)	52.41 (16.69)	70.69 (10.89)
JSS 3	30 (18.5)	45.11 (17.89)	65.89 (10.67)
SSS 1	27 (16.7)	73.45 (112.82)	62.43 (18.48)
SSS 2	27 (16.7)	50.37 (18.61)	74.20 (10.92)
SSS 3	26 (16.0)	48.59 (16.71) F (5,156)= 1.257, p= 0.286	70.13 (10.93) F (5,156)= 4.432, p= 0.001*
Religion			
Christianity	151 (93.2)	53.18 (50.46)	67.83 (13.39)

Islam	11 (6.8)	46.36 (19.46) t(160)= 0.444, p= 0.657	61.52 (16.89) t(160)= 1.482, p= 0.140
Ethnic Group			
Yoruba	143 (88.3)	48.95 (16.89)	67.17 (14.00)
Igbo	13 (8.0)	94.36 (163.31)	69.74 (10.67)
Hausa	1 (0.6)	73.33	56.67
Others	5 (3.1)	48.00 (11.45)	70.00 (13.74)
		F (3,158)= 3.662, **p= 0.014***	F (3,158)= 0.401, p= 0.753
Family Experience 1 (Have a relative with asthma)			
Yes	24 (14.8)	50.00 (18.04)	66.81 (12.10)
No	138 (85.2)	53.19 (52.56)	67.50 (13.98)
		t (160) = -0.293, p = 0.770	t (160) = -0.230, p = 0.819
Family Experience 2 (Have lived with or known someone with asthma)			
Yes	74 (45.7)	48.60 (16.15)	68.54 (14.59)
No	88 (54.3)	56.17 (64.76)	66.44 (12.88)
		t (160) =-0.980, p = 0.329	t (160) = 0.974, p = 0.332

[x] Significant at $\alpha < 0.05$, t = t value, F = ANOVA value, p = level of significance.

Discussion

The study was conducted to determine the association between socio-demographic characteristics of secondary school students and their knowledge and perceptions of asthma in Ile Ife, South- West, Nigeria in an intervention study.

The sex distribution in this study had more female participants than male participants. This result is also similar to the study conducted by Shaw et al (2005) which reported female participants higher in number than male participants. This can be explained also that girl- child education is given an utmost priority among the study population. The result also showed higher Christian participants and Yoruba participants than any other religion and tribes respectively. This result can be explained by the fact that the sampled study population reflects the dominant religion being practiced in the communities and they are located in Yoruba land. This invariably shows that the study environment will usually reflect the characteristics of the study population. The result also showed that more participants in the intervention group have more family experiences and have heard about asthma more than the control group. This can be explained by the fact that prevalence of asthma is likely to be more in the urban/ semi- urban community which the population in the intervention group belongs than in the rural communities which the control group participants belong. This is corroborated by a study done by Shimwela et al (2014), Pesek et al (2010) and Falade et al (2009).

This study revealed that prior to health education intervention, only ethnicity of the socio-demographic factors considered in this study was significantly associated with the perceptions levels of the participants at the pre- test stage. Other socio- demographic factors considered were not significantly associated with the knowledge and perceptions levels of the participants at the pre- test stage. This result was in agreement with some closey related studies but also at variance with some (Ilesanmi et al, 2017; Chen et al, 2006; Fadzil et al, 2002; Meyer et al, 2001; Gibson et al, 1998). On the other hand, this study revealed that there were significant associations between socio- demographic variables (class level,

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religion) and post- test knowledge of asthma in the intervention group. The result by inference showed that the increased knowledge of asthma obtained subsequent to the health education intervention was associated to class level and religion of the secondary school students. This outcome was in line with a closely related study carried out by Fadzil et al (2002) which found a significant association between parental asthma knowledge and level of education. The result was also in line with a similar study carried out by Meyer et al (2001) among adults with asthma which showed that better knowledge was associated with higher education. The outcome is in contrast to a similar study conducted by Gibson et al (1998) which found a significant association between asthma knowledge and ethnic background, age, body mass index and residential area of the high school students. The outcome is also in line with a closely related study which found that higher asthma knowledge scores were associated with higher level of parent education, race (white versus non- white), higher socioeconomic status and child- reported family functioning. The result of the significant association between post- test asthma knowledge and religion could not be supported by related studies. However, because majority of the participants in the study were Christians (93.2%), it could be inferred that the influence of their religion significantly contributed to how they were able to receive the health education programme intervention on asthma. Also in this study, class level alone was found to be in significant association with post- test perceptions levels of the participants. From this result, it can be inferred that following health education intervention increase in perceptions of asthma of the studied participants was associated with class level. This result is in contrast with the result of a study by Chen et al (2006) who found a significant association between asthma perceptions and age, gender, Body mass index, history of exercised- induced symptoms and psychological state of the children with asthma who were studied. The result of this study is closely related with a study by Abubakari et al (2016) who studied illness perceptions representation among diabetes patients. They found that educational attainment contributed significantly in predicting patients' illness perception representations about their diabetes.

Limitation of the study

This study is an example of an effective method in which researchers and school teachers incorporate an asthma health education program into a structured health education class. However, the competing demands for students' time during a typical school day posed problems during the conduct of the school-based study. Attrition during each follow-up phase could also have affected the study results. Reasons for diminishing sample size from baseline included: 1) absence during data collection, 2) refusal to complete questionnaire, or 3) absence during intervention, therefore follow-up data are not valid. These were handled by the increasing of the sample size at the onset of the study. Despite potential problems with attrition, the school-based environment is fitting for asthma research as well as other health related programs.

Conclusion

The outcome of this study shows a significant association between pre- intervention asthma perception scores and religion of the secondary school students. It also shows a significant association between post-intervention asthma knowledge scores and class level and religion of the secondary school students. Lastly, in this study, there was significant association between post- intervention perceptions scores and class level of the secondary school students of Ile- Ife, South-West, Nigeria.

Recommendation

Based on the findings in this study, the followings are therefore recommended:

1. The study should be repeated in a different geographical area to identify commonalities and differences between the two populations.
2. It is important to survey those adolescents not currently attending school.

3. There is a need to conduct the research among other age categories of asthmatics and their care givers to ascertain whether these predictors identified in this study before and after intervention can be generalised when all conditions of the study are maintained.
4. There is a need to conduct the research among the teachers of these students so as to improve their knowledge and perceptions of asthma especially as the result of this study indicated that the major source of information for the students about asthma was not from school.
5. Further researches are needed on association of socio- demographic characteristics and knowledge and perceptions of other health issues such as HIV, sexual transmitted infections (STI), epilepsy, diabetes and obesity which are also significant health issues among adolescents and older school age children.

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