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Full Length Research Paper

Knowledge, attitudes and behaviors of premarital sex among bedsit-living students in Hue City, Vietnam

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The study aimed to explore knowledge, attitudes and behaviors of premarital sex and its associated factors among bedsit-living students. A community-based cross-sectional study was conducted in Hue city, Vietnam in 2015. Multi-stage cluster sampling was used to recruit students. Data were collected by using a self-administered questionnaire at participant's room. A total of 730 students (men/women: 44.2%/55.8%, mean age: 20.9 years) were enrolled. Prevalence of premarital sex was 11.9% with an average age of first sexual intercourse at 19.8 ± 2.2 years. For premarital sex, 13.3 to 19.5% students did not have enough knowledge of reproductive health and safe sex, 34.1% agreed on different situations. Male students accepted premarital sex more than female students did (45.8% vs. 24.8%, p < 0.001, χ^2). Gender, age group, marital status, knowledge of consequences of premarital sex and knowledge of STDs prevention were associated with attitude and practice of premarital sex (p < 0.05, χ^2). The prevalence of premarital sex was comparable with recent domestic and regional data, yet implied an increased trend. Up to one-fifth of students were not equipped with enough knowledge of safe sex, therefore, reproductive and sexual health education for bedsit-living students should be reinforced.

Key words: Premarital sex, knowledge, attitude, behavior, students.

INTRODUCTION

The incidence of premarital sexual activity among youth has been dramatically increased due to the widening gap between age at menarche and age at marriage (Gibbs et al., 2014; Motamedi et al., 2016; Shu et al., 2016; Yip et al., 2013). As most acts of premarital sex are unprotected, sexually active youth are at high risk of exposing to the human immunodeficiency virus/acquired immunodeficiency syndrome, sexually transmitted diseases (STDs), unintended pregnancy and resultant unsafe abortion (Azmawati et al., 2017; Shu et al., 2016; Xu et al., 2019; Yip et al., 2013). In many countries, approximately up to 51% of adolescents engage in premarital sex (Akibu et al., 2017; Azmawati et al., 2017; Regassa et al., 2016; Teferra et al., 2015; Tran et al.,

2018; Widyatuti et al., 2018). Additionally, the World Health Organization reported 22 million girls aged 15 to 24 years experienced unplanned pregnancies in 2014 and a worldwide increase in number of unsafe abortions from 19.7 million in 2003 to 21.6 million in 2008, almost all in developing countries (Shu et al., 2016; WHO, 2011).

As in other Asian countries, Vietnam has a strong norm that prohibits premarital sexual contact. Nonetheless, the customary attitude has been changing due to a multifactorial impact (Gibbs et al., 2014; Shu et al., 2016; Xu et al., 2019; Yip et al., 2013). Declining influence of family, increasing urbanization, migration and the exposure to social network have collectively contributed to major changes in social and sexual behavior among adolescents (Gibbs et al., 2014; Shu et al., 2016; Tran et al., 2018; Xu et al., 2019). A nationally representative sample of youth aged 22 to 24 years using a self-administered questionnaire found that 33% of men and 4% of women in urban and 26% of men and 3% of women in rural areas admitted premarital sex (Ghuman et al. 2006).

Sexual activity is easily initiated when young people are still physically, emotionally, and cognitively developing while living away from home without family monitoring (Regassa et al., 2016; Yip et al., 2013). Systematic information on any changes that have occurred in the prevalence and context of premarital sexual activity would help provide an insight into the relationship among social and economic change, premarital sexual behavior and the transmission of STDs. However, not only is there a lack of reliable evidence that the prevalence of premarital sex is rising in Vietnam, but there is little information regarding the context and associated factors of premarital sex (Ghuman et al., 2006). This is a significant gap in the national data. This study was, therefore, conducted to investigate knowledge, attitude and practice of premarital sex among the subpopulation of bedsit-living students in Hue city and their associated factors.

MATERIALS AND METHODS

Study design

A community-based, cross sectional sexual survey was carried out in Hue city, Vietnam in 2015. Hue is a sub-metropolitan city, in the Central Vietnam and located there, is a regional university, meaning that the city is home to thousands of immigrated students of both undergraduate and graduate levels. The target group was immigrated students who were living in rented accommodation in Hue city. Multi-stage cluster sampling method was used (Azmawati et al., 2017; Widyatuti et al., 2018). The city has 27 urban wards. In stage 1, 5 wards with high density of residential bedsits close to Hue university schools were selected. Houses and households listing for selected wards were obtained with the assistance of local government. There were 1364 registered bedsits which homes to 21810 students. In stage 2, 146 bedsits were randomly selected and all residing students aged 18 to 30 years were asked

to enroll in this survey, except for foreign students. Data were collected by using a self-administered questionnaire at participant's room to create favorable conditions. Six trained staff members from the Faculty of Public Health, Hue University of Medicine and Pharmacy followed up the data collection process closely.

Sample size

Sample size was calculated based on a previous publication which reported 38.8% students considered premarital sex (Thi et al., 2012). Therefore, the estimated size was:

$$n = 1.96^2 \ \frac{(1-0.388)\times 0.388}{0.05} = 364.9 \approx 365$$

enrolled participants were divided into 2 age groups, 18 to 20 and 21 to 30 for further evaluation of associated factors.

Statistical analysis

Continuous data were presented as mean ± standard deviation and categorical data were given as counts and percentages. Pearson's Chi-squared test was used to ascertain the association between knowledge, attitude, practice of premarital sex and gender, age group, marital status. All analyses were performed using SPSS 18.0 software. P values < 0.05 indicated statistical significance for all comparisons.

Ethical clearance

Ethical standing and protocol of this study were approved by the institutional review board of Hue University of Medicine and Pharmacy. Participants reserved the right to take part in the survey and were not required to declare name, age or personal information. Written consent was obtained from all participants.

RESULTS

Knowledge, attitude and practices of premarital sex

Seven hundred and thirty bedsit-living students including 323 men (44.2%) and 407 women (55.8%) agreed to participate in the survey. The mean age was 20.9 years (range, 18 to 30 years). Among these, 87 respondents (11.9%) had experienced premarital sex at an average age of 19.8 ± 2.2 years (range, 14 to 25 years), including 60 men and 27 women. In this subset of premarital sex, 80/87 individuals (91.9%) admitted using contraceptives (65.5% used frequently and 26.4% used unfrequently) and 7/87 (8.1%) claimed never use contraceptives. Types of contraceptive were condom (93.8%), birth control pills (26.3%), emergency contraceptive pills (8.8%), calendar based (2.5%) and withdrawal (1.3%). Eleven participants (12.6%) reported pregnancy, of these 9 decided to terminate the pregnancy by abortions. Knowledge and attitude toward premarital sex of respondents was summarized in Table 1. Men were less knowledgeable

Table 1. Knowledge and attitudes of students toward premarital sex.

Questions	Male (%), n = 323	Female (%), n = 407	P value	Total (%), n = 730
Knowledge				
Do not know any consequences of premarital sex	58 (18.0)	39 (9.6)	<0.001	97 (13.3)
Do not know or believe that women cannot be pregnant in the first sexual intercourse	65 (20.1)	62 (15.2)	0.08	127 (17.4)
Do not know any contraceptive methods	43 (13.3)	55 (13.5)	0.93	98 (13.4)
Do not know where providing contraceptive methods	63 (19.5)	79 (19.4)	0.97	142 (19.5)
Do not know how to avoid STDs	46 (14.2)	68 (16.7)	0.35	114 (15.6)
Do not know consequences of abortion	27 (8.4)	21 (5.2)	0.08	48 (6.6)
Do not know where providing safe abortion services	37 (11.5)	34 (8.4)	0.16	71 (9.7)
Attitudes				
Premarital sex is not allowed	175 (54.2)	306 (75.2)	< 0.001	481 (65.9)
Premarital sex is acceptable if it is consensual	96 (29.7)	60 (14.7)	< 0.001	156 (21.4)
Premarital sex is acceptable if understanding contraceptive methods	30 (9.3)	19 (4.7)	0.01	49 (6.7)
Premarital sex is acceptable if both believe in a mutual love	5 (1.5)	7 (1.7)	0.83	12 (1.6)
Premarital sex is acceptable if marriage has been planned in near future	6 (1.9)	5 (1.2)	0.44	11 (1.5)
Premarital sex is acceptable if wedding date has been fixed	10 (3.1)	11 (2.7)	0.74	21 (2.9)

than women in terms of consequences of premarital sex ($p < 0.001$, x^2). Premarital sex was refused by 65.9% of participants whilst 34.1% agreed on different situations, in which 21.4% accepted if it is consensual and 6.7% accepted if understanding contraceptives.

There were 346 (47.4%) and 384 (52.6%) students in the age groups of 18 to 20 years and 21 to 30 years, respectively. Participants of the age group of 21 to 30 years had higher rate of knowing consequences of premarital sex, accepting premarital sex and practicing premarital sex than those in the age group of 18 to 20 years (89.8% vs. 83.2%, 35.7% vs. 32.4% and 16.4% accepted premarital sex more than female students did (45.8% vs. 24.8%, $p < 0.001$, x^2). Associated factors of attitude and practice of

premarital sex were summarized in Tables 2 and 3.

Associated factors of premarital sex

Gender, age group, marital status, knowledge of consequences of premarital sex and knowledge of STDs prevention were associated with attitude toward premarital sex ($p < 0.05$, χ^2). Similarly, gender, age group, marital status, knowledge of consequences of premarital sex and attitude toward premarital sex were associated factors of practice of premarital sex ($p < 0.05$, χ^2).

This study addressed a specific subpopulation of students living in rented accommodation who were generally considered more susceptible to

unsafe sex. As a result, 11.9% of students admitted premarital sex, a rate which was in line with recent domestic and regional data, yet lower than those of Africa, West Asia and developed countries (Adhikari and Tamang, 2009; Azmawati et al., 2017; Do and Fu, 2010; Lou et al., 2012; Rathavuth, 2009; Song and Ji, 2010; Tangmunkongvorakul et al., 2012; Thi et al, 2012a; Tran et al., 2018; Yip et al., 2013). However, this prevalence seems to be higher than that of the previous national data ((Ghuman et al. 2006; Mensch et al., 2003). This finding implies a trend of increased popularity of premarital sex among students, particularly those living away from family. Traditionally for most Asian people, particularly women, the onset of sexual activity coincides with marriage. However with rising ages

Table 2. Associated factors of attitude toward premarital sex.

Variable		Attitude toward premarital sex			P value
		Accept (n=249, 34.1%)	Not accept (n=481, 65.1%)	Total (n=730, 100%)	
Gender	Men	148 (45.8)	175 (54.2)	323 (44.2)	< 0.001
	Women	101 (24.8)	306 (75.2)	407 (55.8)	
Age group	18 – 20 years	112 (32.4)	234 (67.6)	346 (47.4)	< 0.05
	21 – 30 years	137 (35.7)	247 (64.3)	384 (52.6)	
Marital status	Never had partner	51 (22.1)	180 (77.9)	231 (31.6)	< 0.05
	Having/Had partner	198 (39.7)	301 (60.3)	499 (68.4)	
Know consequences of premarital sex	Yes	203 (32.1)	430 (67.9)	633 (86.7)	< 0.05
	No	46 (47.4)	51 (52.6)	97 (13.3)	
Know how to prevent STDs	Yes	197 (32.0)	419 (68.0)	616 (84.4)	< 0.05
	No	52 (45.6)	62 (54.4)	114 (15.6)	

of marriage and changing sociocultural norms, young people have more liberal attitude toward premarital sex with an increasing number of sexual activity before marriage (Cai et al., 2013; Do and Fu, 2010; Gibbs et al., 2014; Htay et al., 2010; Katayon, 2014; Motamedi et al., 2016; Mudassir et al., 2010; Philippines, 2014; Shu et al., 2016; Song and Ji, 2010; Tangmunkongvorakul et al., 2011; Xu et al., 2019; Yip et al., 2013).

We found that male students were more sexually active than their female counterparts (69% vs. 31%). This finding was also in keeping with previous data as men have more permissive attitudes towards premarital sex than women (Adanikin et al., 2017; Berhan and Berhan, 2015; Motamedi et al., 2016; UNFPA, 2015; Xu et al., 2019; Yip et al., 2013), probably because men

have greater freedom to be involved in sexual relation (Motamedi et al., 2016). Some studies suggest that young men and women engage in premarital sex in different circumstances. Men are more likely influenced by pleasure, recreation and peer pressure and impulsivity whereas women are driven by emotion (Gibbs et al., 2014; Motamedi et al., 2016). Thus, while young women tend to accept their first sex with a committed relationship or with a partner they planned to marry, young men are more likely to have sex with a casual partner or sex worker (Nguyen and Liamputtong, 2007; UNFPA, 2015). However, this pattern appears to be changing in some settings as attitudes towards premarital sex among young women become more permissive, meaning that more young women (33%) and men (42%) were supportive of sexual activity in the context of

romantic relationships (Motamedi et al., 2016; Shu et al., 2016; Tangmunkongvorakul et al., 2011; Yip et al., 2013).

In Vietnam, achievements from the large-scale economic reform have had great impact on the national socioeconomic status (Gibbs et al., 2014; Tran et al., 2018). People have more freedom to make their own choice and more contacts with Western culture. In addition, parents seem to lose some of their control over their children when they become financially independent (Nguyen and Liamputtong, 2007). Internet and social networks have been widely used as a space to learn about sexual relationships (Azmawati et al., 2017; Gibbs et al., 2014; UNFPA, 2015). As a result, young people have more permissive attitude toward dating and premarital sex than their older counterparts (Lou et al., 2012; Nguyen and

Table 3. Associated factors of practice of premarital sex.

Variable		Practice premarital sex			P value
		Yes (n=87, 11.9%)	No (n=643, 88.1%)	Total (n=730, 100%)	
Gender	Men	60 (18.6)	263 (81.4)	323 (44.2)	< 0.05
	Women	27 (6.6)	380 (93.4)	407 (55.8)	
Age group	18 – 20 years	24 (6.9)	322 (93.1)	346 (47.4)	< 0.05
	21 – 30 years	63 (16.4)	321 (93.6)	384 (52.6)	
Marital status	Never had partner	9 (3.9)	222 (96.1)	231 (31.6)	< 0.05
	Having/had partner	78 (15.6)	421 (84.4)	499 (68.4)	
Know consequences of premarital sex	Yes	65 (10.3)	568 (89.7)	633 (86.7)	< 0.05
	No	22 (22.7)	75 (77.3)	97 (13.3)	
Attitude toward premarital sex	Accept	62 (24.9)	187 (75.1)	249 (34.1)	<0 .05
	Not accept	25 (5.2)	456 (94.8)	481 (65.9)	

Liamputtong, 2007; Shu et al., 2016; Xu et al., 2019; Yip et al., 2013). In this survey, we observed an interactive association between attitude and practice of premarital sex with gender, age group, marital status and knowledge of premarital sex. This finding was similar with a domestic report (Thi et al., 2015b).

In some settings, young people who are out-of-school are also more likely to engage in premarital sex (Azmawati et al., 2017; Yip et al., 2013). A study of urban adolescents aged 17 to 20 in Thailand reported that 90% of out of school boys and 53% of out of school girls had commenced sexual activity, compared with 33 and 15% who were still at school, respectively (Tangmunkongvorakul et al., 2012). Another study of dropout college students in Nigeria found 73.9% students had full sexual intercourse (Adanikin et al., 2017). In Cambodia, 18% of young men in urban areas have had premarital sex compared with 6% in rural areas (Rathavuth, 2009).

Family monitoring has been proved a protective factor against unsafe sex (Azmawati et al., 2017; Widyatuti et al., 2018). A lack of parental support or family attachment has been associated with early initiation of sex (Motamedi et al., 2016; Shu et al., 2016; UNFPA, 2015; Yip et al., 2013). While religious taboos may be a barrier limiting open discussion of sexual health and access to services, a family's religious or spiritual beliefs can also be protective against risky sexual behaviors (Azmawati et al., 2017; Chamratrithirong et al., 2010). Peers are also a strong influence on young people's attitudes and behaviors, especially among men (Akibu et al., 2017; Azmawati et al., 2017; Gibbs et al., 2014). Additionally, a perception that the majority of friends or peers are already having sex increases pressure on young people, and has been associated with early sexual initiation in

many countries including Vietnam (UNFPA, 2015).

Premarital sex itself is not necessarily a risk factor for poor sexual and reproductive health. As adolescents grow up and mature, increasing interest in sex and sexual experimentation are a normal part of physical and mental development. Therefore, young people who are equipped with knowledge of safe sex and access to services can have healthy, positive sexual relationships (UNFPA, 2015). Increase capacity in youth sexual and reproductive health program and service delivery is warranted. Understanding how youths made decisions to engage in early sexual activities is critical for intervention efforts aimed at fostering positive youth development and decreasing the negative outcomes of youth sexual behavior.

This study has several limitations. The relative homogeneity of the study population in terms of occupation, educational background, generation and living condition may affect generalization. In addition, small sample sizes recruited from a single community, inaccessibility of other associated factors such as sexual health education, peer influence, family socio-demographic were also consistent limitations.

Conclusion

The prevalence of premarital sex among the subset of bedsit-living students was comparable with national and regional data. Up to one-fifth of the studied population were not well equipped with knowledge of safe sex. Gender, age group, marital status and knowledge of consequences of premarital sex were associated factors of attitude and practice. The present study also provides evidence that knowledge, attitude and practice of

premarital sex are connected. Reproductive and sexual health education for immigrated students should be reinforced. The intervention effort has to focus on the risk factors among this subset and provide them with convenient, optional and accessible services.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

Relationship of combined frequency of hypertension and diabetes mellitus to socioeconomic status: A comparative study in Anambra State of Nigeria

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There are conflicting reports on the relationship between hypertension and diabetes mellitus (DM) with socioeconomic status. This study explores this relationship individually and jointly. This is a cross sectional comparative study. Adults that participated in medical outreach organized for high and low socioeconomic status (SES) were tested for hypertension and DM. Mean age in years for high and low SES was 58.69 (± 10.26) and 57.77 (± 15.54), respectively. Widows were significantly more than widowers (P < 0.001). Frequency of hypertension in middle age (45 to 64 years in high and low SES) was 58.0 and 71.9%, respectively (P = 0.009). Frequency of DM was 19.2 and 7.3% in high and low SES respectively (P < 0.001). Combined frequency of hypertension and DM was 14.0 and 6.0% in high and low SES respectively (P = 0.002) and 13.8 and 5.9% in the middle age group in high and low SES respectively (P = 0.034). Severity of hypertension was more in low than high SES (P = 0.001). The prevalence and severity of hypertension among middle age in low SES is higher than in high SES. Combined frequency of hypertension and DM is more in high than low SES.

Key words: Socioeconomic status, hypertension, diabetes mellitus, combined frequency.

INTRODUCTION

Hypertension and diabetes mellitus are major non-communicable diseases (NCD) and their frequency worldwide is rising. In 2015, an estimated 40 million deaths occurred due to NCDs, accounting for 70% of the overall total of 56 million deaths. Most of such deaths were caused by the four main NCDs, namely: cardiovascular disease, 17.7 million deaths (accounting for 45% of all NCD deaths); cancer, 8.8 million deaths (22%); chronic respiratory disease, 3.9 million deaths (10%); and diabetes, 1.6 million deaths (4%)(WHO, 2017). So, apart from cancer and chronic respiratory disease, the first two commonest causes of death due

to NCDs are hypertension and diabetes mellitus.

Hypertension is a modifiable risk factor for cardiovascular morbidity and mortality. Its frequency seems higher in urban areas than in rural areas (Akinlua et al., 2015). This suggests a socioeconomic status (SES) factor in distribution of hypertension. There are conflicting reports of relationship between socioeconomic status and hypertension. Hypertension is believed to be a disease of the rich and developed nations (Fikadu and Lemma, 2016). Hence hypertension is expected to be more frequent in higher SES than in lower SES. Fikadu and Lemma (2016) found such positive relationship

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among teachers and bankers in Addis Ababa, Ethiopia in 2016. In Nigeria, some studies report positive relationship (Bunker et al., 2010) and others report that hypertension is higher in low socioeconomic status (Adedoyin et al., 2005). Positive relationships have been found in other low and middle income countries like India (Gilberts et al., 1995), Jamica (Mendez et al., 2003), India (Soudarssanane, 2006) and Ghana (Addo et al., 2009).

Frequency of diabetes mellitus is rising. In 2015 it was estimated that there were 415 million people with diabetes aged 20-79 years and 5 million deaths attributable to diabetes. Three quarters (75%) of those with diabetes were living in low- and middle-income countries. The number of people with diabetes aged 20-79 years was predicted to rise to 642 million by 2040 (Ogurtsova et al., 2017). This also suggests an SES factor in the distribution of diabetes mellitus. Life style and diet are important factors affecting the disease hence it is expected to be more frequent in high socioeconomic status than in low socioeconomic status. Danjin et al. (2016) found that diabetes mellitus was more frequent in urban dwellers than rural dwellers (Danjin et al., 2016). Shittu et al. (2017) reported that it is more prevalent among people with low income.

Hypertension and diabetes are associated with increased risk of CVD and renal disease. The risk is exacerbated when both are present (Govindarajan et al., 2006). Risk of a patient having one when the other is present is higher than when one is not present. A direct correlation between plasma insulin levels and blood pressure exists (Sechi et al., 1992; Sowers et al., 2001). There are studies on the distribution of hypertension and diabetes by socio-economic status but little has been done on the combined frequency of the diseases and socioeconomic status. The aim of this study is to compare the relationship of the combined frequency with SES.

MATERIALS AND METHODS

Type of study

This is a cross sectional comparative study.

Sample size determination

Sample size is determined using the formula for determining sample sizes needed to detect a difference between two proportions (Fleiss et al., 2003).

$$n' = \frac{\left(z_{\alpha/2}\sqrt{2\bar{P}\bar{Q}} + z_\beta\sqrt{P_1 Q_1 + P_2 Q_2}\right)^2}{(P_2 - P_1)^2} \tag{1}$$

$$n = \frac{n'}{4}\left(1 + \sqrt{1 + \frac{4}{n'|P_2 - P_1|}}\right)^2 \tag{2}$$

Where n' = sample size uncorrected for continuity

n = the desired sample size incorporating the continuity factor.
Probability of type 1 error, α, is set at 0.05
Probability of type 2 error, β, is set at 0.2. Conventionally, β is set at four times α (Fleiss et al., 2003).
$z_{\alpha/2}$ = 1.96 (the standard normal variate for α of 0.05 for a 2-tailed test)
z_β = 0.84 (standard normal variate for power of 80%, 1-β).
P_1 = frequency of hypertension or diabetes mellitus, whichever is higher from previous study. National prevalence of hypertension is 6.2-48.8% for males and 10- 47.3% for females (Fikadu and Lemma, 2016). National prevalence of diabetes mellitus is 0.8 to 11% (Dahiru et al., 2016). Frequency of hypertension is higher than prevalence of diabetes mellitus. Hence, to obtain a higher minimum sample size that will give higher power to the study, the frequency of hypertension will be used for the sample size determination. From previous study, frequency of hypertension in high SES is 11.2 and 3.6% in low SES (Adedoyin et al., 2005).

Thus P_1 = 0.112 (frequency of hypertension in high SES)
$Q_1 = 1-P_1 = 1 - 0.112 = 0.888$
$P_2 = 0.036$ (frequency of hypertension in low SES)
$Q_2 = 1 - 0.036 = 0.964$
$\bar{P} = \frac{(P_1 + P_2)}{2} = \frac{0.112+0.036}{2} = 0.074$
$\bar{Q} = 1-\bar{P} = 1 - 0.074 = 0.926$

Applying Equation 1, we have

$$n' = \frac{\left(1.96\sqrt{2 x 0.074 \, x \, 0.926} + 0.84\sqrt{0.112 \, x \, 0.888 + 0.036 \, x \, 0.964}\right)^2}{(0.036 - 0.112)^2} = 184.8$$

Applying Equation 2, we have

The minimum desired sample size is 210

Methods of data collection

Socioeconomic status (SES) in Nigeria depends on level of education, occupation and income. There are five categories: I, II, III, IV and V, according to Oyedeji (1985). So he summarized the groups into two: the high made up of the first 3 groups and the low made up of the last 2 groups. Those that belong to the high are the rich people who are politicians, professionals, university graduates with post graduate qualifications, business executives, land lords, car owners, etc. The low SES is made up of peasant farmers, manual laborers, daily paid workers that are mainly uneducated or at most attended secondary school education and degree holders that are jobless (Oyedeji, 1985). Thus one can belong to high SES if he has high income and occupation without high education. One can also belong to the low SES with high education but low occupation and low income.

Knighthood of St Christopher is an order in the Church of Nigeria, Anglican Communion. The members belong to the high socioeconomic status. They support the church financially among other ecclesiastical duties assigned to them. The members meet at the beginning of each year to celebrate their Family Day. During the occasion of their 2018 Family day celebration, medical outreach was extended to them. The medical exercise was to educate them on the prevalence of hypertension, diabetes mellitus and chronic kidney disease, the epidemiology and complications of the diseases and the availability of screening tests for them. They were counseled before the exercise and they gave their oral consent. Those that did not consent were excluded. Those that consented were asked to come for the exercise fasting overnight and with morning urine sample collected in clean specimen bottle. They are 214 that attended and participated.

Table 1. Distribution of participants by socio-economic status .

SES	Gendern (%)		
	Male	Female	P value
High; N = 214	97 (45.3)	117 (54.7)	0.052
Low; N = 317	75 (23.7)	242 (76.3)	<0.0001
Total; N = 531	172 (32.4)	359 (67.6)	<0.0001

Interviewer administered data capture proforma, adapted from the WHO STEPwise approach (WHO, 2005) to chronic disease risk factor surveillance, was used to elicit information from the participants. Twenty young medical doctors (House Officers) were trained to collect the data. Data on gender, age, academic qualification, occupation, marital status, present medical challenges (hypertension, diabetes mellitus) were collected. Anthropometric measurements were done. Blood pressure and fasting blood sugar were measured. Age was recorded to the nearest whole number and further classified as young to middle aged adult, (20- 44 years), middle aged adult, (45 to 64 years) and old adult (65 years and above). (Health, United States, 2006).

Blood pressure (BP) was measured with mercury sphygmomanometer. The measurement was done three times at three minutes' interval with the participant sitting down and arm resting on a table. The value at which the first Korotkoff sound is heard is the systolic pressure and the value at which the last (fourth) is barely audible is the diastolic pressure. This was repeated three times and the average of the last two readings was taken as the blood pressure. High blood pressure was systolic blood pressure equal to or higher than 140 mmHg and/or diastolic blood pressure equal to or higher than 90 mmHg (Chobanian et al., 2003). Participants that are known hypertensives on treatment are recorded as high blood pressure even if the BP measurement is not high.

Height was measured using an improvised stadiometer. A measuring tape was used to calibrate a portion of the wall in the examination hall. The calibration was done in centimeters to the nearest 0.1 cm. The participant stood on bare feet with back against the wall with his/her heels touching the wall. The height was read by placing a flat object (ruler) horizontally on the crown of the head and at 90° to the calibration on the wall. The value, to the nearest 0.1 cm was read and recorded as the height.

The weight was measured using Hanson Emperors Bathroom Scale calibrated to the nearest kilogram. The scale was set to zero. The participant, in light dress, having removed his/her phone, wrist watch and other heavy materials on his/her body climbed the scale and looked straight forwards. The examiner read the value to the nearest kg and recorded that as the weight.

Double G sugar monitor (Blood glucose meter) manufactured in USA for Double G Industries Ltd., exclusively distributed in Nigeria by Davinny Pharmaceutical Lt., was used to check the fasting blood sugar level. The thumb was pierced with a lancet after cleaning with cotton wool spirit swab. The tip of the test strip was placed at the edge of the blood expressed from the prick. The blood seeped in and filled the test area. The value automatically appeared in 5 s and was taken as the blood sugar level. Fasting blood sugar level above 126 mg/dl was regarded as high and recorded as diabetes mellitus. Known cases of diabetes mellitus on treatment are also recorded as diabetes mellitus even if the FBS is less than 126 mg/dl.

Association of General and Private Medical Practitioners of Nigeria (AGPMPN), Anambra State branch organized a medical outreach as part of their Scientific Conference 2018. Ebenebe, a rural town of about 45,897 according to the 2006 Nigerian Census, was selected for the medical outreach. The inhabitants are peasant farmers, petty traders, manual laborers and artisans. They lack adequate medical care and have poor health indices. The Local Government Chairman, the Igwe (king) of the town and the priests in the local churches were informed of the outreach in the advocacy visits before the event. They consented and mobilized their people for the activity. The methodology for collecting data used for the Knights was used for the rural people. For blood sugar test, some ate food before coming for the exercise. For those people, the sugar level was recorded as random blood sugar. Values above 160 mg/dl were regarded as high. The number that attended and participated is 317.

Ethical clearance

Ethical clearance was obtained from Chukwuemeka Odumegwu Ojukwu University Teaching Hospital, Amaku, Awka; COOUTH/ CMAC/ETH.C/VOL.1/0027.

Data analysis

Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 20. Proportions were calculated. Data analysis was done with Z and T tests. Fisher's exact test was used when the expected values were less than 5. Results are presented in tables as proportions with their P - values.

RESULTS

The mean age of the participants in years in the high SES is 58.69 ± 10.26 and 57.77 ± 15.54 in the low SES. The distribution of participants by socio-economic status and gender is as shown in Table 1. Having dichotomized the participants into high SES and low SES, their educational status, occupation and income are excluded in this analysis.

In Table 2 the distribution of gender of participants by marital status is shown. There are significantly more widows than widowers in each SES. The frequency of hypertension in the high SES as represented by the knights and ladies is 60.7 and 66.9% in the low SES as represented by the Ebenebe community. The frequency of diabetes mellitus and combined frequency of both disease conditions are shown in Table 3. Table 4 shows the distribution of the frequency of hypertension and diabetes mellitus individually and jointly stratified by age groups.

Hypertension affects the middle adult age group more in the low SES than in the high SES but for diabetes

Table 2. Distribution of gender of participants by marital status and socio-economic status.

Gender	Marital status	High SES	Low SES
Male	Single	0	4
	Married	96	61
	Widowed	1	10
	Total	97	75
Female	Single	0	15
	Married	97	106
	Widowed	20	121
	Total	117	242
Proportion of widowers to once married men		1/(96+1) = 1.03%	10/(61+10) = 14.1%
Proportion of widows to once married women		20/(97+20) = 17.1%	121/(106+121) = 53.3%
P value		**<0.0001**	**<0.0001**

Table 3. The frequency of hypertension, diabetes mellitus and combined frequency of both disease conditions in high and low SES.

Variable	High SES N = 214 n (%)	Low SES N = 317 n (%)	P value
Hypertension	130 (60.7)	212 (66.9)	0.150
Diabetes Mellitus	41 (19.2)	23 (7.3)	<0.001
Combined frequency	30 (14.0)	19 (6.0)	0.002

mellitus the middle and old adults bear the brunt more. The combined frequency is more in the high SES especially in the middle adult group in high SES. The severity of hypertension as measured by the mean of the systolic BP values and the mean of the diastolic BP values are shown in Table 5. So also is the severity of diabetes mellitus as measured by the mean of the blood sugar levels. This is stratified by SES. From Table 5, the average person from 20 years and above from the low SES is a systolic hypertensive since the mean systolic blood pressure is more than 140 mmHg.

DISCUSSION

The current study demonstrated that females participated in the outreach more than males (Table 1). This is similar to the findings of Ige and Nwachukwu (2008). Females have better health seeking behavior than males (Mackenzie, 2007; Ihaji, 2014). This may explain why more females participated than males. Table 2 shows that there are more widows than widowers. Generally, men marry women younger than their age. Since age is an important factor in mortality, men tend to die earlier than their wives. This may also explain why more females

attended the outreach because they are in absolute majority. This higher population of widows than widowers is more evident in low SES than high SES. This can also explain why significantly more females than males attended in the low SES than in the high SES.

Frequency of hypertension in high SES is 60.7 and 66.9% in low SES. The difference is not statistically significant. The frequency values found in this work are higher than what have been reported in some literature (Ado et al., 2009; Ulasi et al., 2011; Abegunde and Owoaje, 2013; Makusudi et al., 2013; Anyabolu et al., 2017; Bello-Ovosi et al., 2018). Some researchers have reported that hypertension is associated with low SES (Okpara et al., 2015; Anyabolu, 2017). Others report that hypertension is associated with high SES (Bunker, 2010; Fikadu and Lemma, 2016). This study found no significant difference in the frequency of hypertension in high and low SES. This is similar to the findings of Abegunde and Owoaje (2013) and Adaramaja and Tijani (2014). The high frequency of hypertension may be because the outreach gave free counselling and drugs, hence those that knew that they have hypertension were more likely to avail themselves of the opportunity than those that were not hypertensive.

Frequency of diabetes is 19.2% among the high SES

Table 4. Distribution of the frequency of hypertension and diabetes mellitus individually and jointly stratified by SES and age group in years.

Age group	SES	Hypertension n (%)	Diabetes Mellitus n (%)	Combined frequency n (%)
25 - 44	High SES; N = 19	6 (31.6)	2 (10.5)	0 (0)
	Low SES; N = 66	30 (45.5)	1 (1.5)	0 (0)
	P value	**0.259**	**0.124**	
45 - 64	High SES; N = 138	80 (58.0)	24 (17.4)	19 (13.8)
	Low SES; N = 135	97 (71.9)	10 (7.4)	8 (5.9)
	P value	**0.009**	**0.006**	**0.034**
≥ 65	High SES; N = 57	44 (72.4)	15 (26.3)	11 (19.3)
	Low SES; N = 116	85 (73.3)	12 (10.3)	11 (9.5)
	P value	**0.571**	**0.007**	**0.048**

Table 5. Distribution of severity of morbidity by socioeconomic status.

Variable	High SES		Low SES		P - value
	N	Mean (sd)	N	Mean (sd)	
Systolic BP	214	135.82 (18.42)	317	141.73 (25.20)	0.001
Diastolic BP	214	80.60 (10.35)	317	85.09 (13.76)	<0.001
Fasting blood sugar	213	112.52 (37.89)	310	107.19 (48.29)	0.079

N = number of participants. (sd) = standard deviation. BP is in mmHg. Blood sugar is in mg/dl.

and 7.3% among the low SES and the difference is statistically significant. The frequency we got is lower than some other community findings in Northern Nigeria (Okoduwa et al., 2015; Dahiru et al., 2016; Bello-Ovosi et al., 2018). However, some works reported lower frequency (Danjin et al., 2016; Aladeniyi et al., 2017; Shittu et al., 2017). Nwafor and Owhoji (2001) reported a higher frequency of 23.4% among high SES than 16.0% among low SES**.** Our finding is in agreement with this report but differs from that of Shittu et al. (2017) that found a higher frequency among the low socioeconomic status.

Overall frequency of hypertension does not differ between high and low SES but when stratified by age group, it is found to be significantly more in age group 45-64 years in low SES than in high SES. Thus hypertension is more in the middle age group of the poor segment of the society. The burden of hypertension, measured by both the mean of systolic blood pressure and mean of diastolic blood pressure is more in the low SES than the high SES. It is this segment that engages in manual labour like agriculture. It is also the productive age group of the society that has dependent relatives and carries economic responsibilities.

Similar age group in the high SES suffers more from

diabetes mellitus since more people from high SES suffer from diabetes than from low SES and this significance is in the middle and old age groups. However, the burden of diabetes mellitus measured by the mean value of blood sugar is the same in both segments of the society. The middle age groups of both SES have different challenges. This goes to show that frequency of hypertension and diabetes mellitus depends on SES and this dependence is affected by age group. We did not find similar literature to compare this finding with.The combined frequency of hypertension and diabetes mellitus was found to be 14.0% in high SES and 6.0% in low SES and the difference is significant. This combined frequency is noticed in middle age group and in old age group. It does not exist in the early adult age group. Among the middle age group, the high SES suffers more from the combined frequency than the low SES. The difference in old age group is also significant. It is known that comorbidity of hypertension and diabetes mellitus has worse outcomes than single morbidity (Govindarajan et al., 2006). So these age groups among the high SES are more vulnerable than their counterparts in the low SES. The more vulnerable group is the middle adult age group. Incidentally, the captains of industry, politicians, business executives that hold the economy of the state fall into this

category.

Draw backs

The bench mark for diagnosis of hypertension was 140/90mmHg according to the 7th Joint National Committee (JNC 7) Hypertension Guidelines report. Lower benchmark would have yielded higher prevalence. Moreover, the blood pressure was checked on one occasion only. It is required to be checked on at least two occasions except there is hypertensive emergency. Another drawback is that diabetes mellitus was diagnosed by using the fasting (or random) blood sugar level instead of HbA1c glycated hemoglobin test. These drawbacks were because the data were collected during a medical outreach and it would have been very difficult to gather the same people to repeat the data collection at a later date.

Conclusion

The prevalence and severity of hypertension among middle age group in low SES. Combined frequency of hypertension and diabetes mellitus is more in high than low SES. The middle age group bears the burden of hypertension and diabetes mellitus.

RECOMMENDATIONS

The middle age groups of both socioeconomic classes should be targeted urgently for health intervention. Both groups in their different capabilities hold the economy of the state. Health interventions should be tailored to meet their individual group needs: the low SES will be interventions to control hypertension and the high SES will be interventions to control both hypertension and diabetes mellitus.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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