Co-occurrence of Health Risk Behaviours for Communicable and Non-communicable Diseases among Undergraduates in a Tertiary Institution in South West Nigeria

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Abstract: **Co-occurrence of behaviours that are risk factors for communicable and non-communicable diseases have been reported among young people around the world. However, limited information exist on such co-occurrence among young undergraduates in Nigeria. This study therefore sort to evaluate the prevalence of co-occurrence of health risk behaviours for communicable and non-communicable diseases among undergraduates in a tertiary institution in South West Nigeria as well as identify gender differences and the different patterns of clustering of the selected health risk behaviours. Alcohol drinking and cigarette smoking were selected as risk factors for non-communicable diseases, while having multiple sexual partners and non-condom use were selected as risk factors for sexually transmitted communicable diseases. A cross-sectional design was employed to obtain data from six hundred undergraduates of Obafemi Awolowo University, Ile – Ife, Nigeria. Data obtained were analyzed using descriptive and inferential statistics. The mean age of the respondents was 20 ± 4.0 years. The prevalence of current indulgence in alcohol drinking, cigarette smoking, having multiple sexual partners and non–condom use were 50.3%, 19.2%, 24.7%, and 28.5% respectively. Overall, the prevalence of no risk, one risk, and at least two health risk behaviours were: 36.16%; 24.33%;and 39.49% respectively. Eleven clusters of co-occurring health risk behaviours were identified and more males were found in each cluster than females. However, the cluster with the highest prevalence was alcohol drinking and non-condom use (8.8%). This study reports a high prevalence of co-occurrence of health risk behaviours for communicable and non-communicable diseases among young undergraduates. This may have implication for health promotion and education among young people.**

Keywords: ***Co*****-occurrence, alcohol drinking, cigarette-smoking, multiple sexual partners, non-condom use, young people, Nigeria**

I INTRODUCTION

Far too many young people engage in two or more health risk behaviours that are synergistically responsible for causing several communicable and non-communicable diseases [1], [2]. Alcohol or tobacco use, lack of physical activity, unprotected sex, multiple sexual relationships and/or exposure to violence can jeopardize not only the current health of young people, but also their health as adults, and even the health of their future children [3], [4]. Tobacco smoking and alcohol use, together, increase the risk of having non-communicable diseases especially cardiovascular diseases [5] while, non-condom use and having multiple sexual partners collectively increase an individual`s chance of contracting sexually transmitted infections [6], [7].

Non communicable diseases account for 71% of all deaths globally [8] while, communicable diseases like sexually transmitted infections has led to about 200,000 fetal and neonatal death each year due to sexually acquired syphilis in pregnancy and over 280 000 cervical cancer death each year due to sexually acquired human papillomavirus. Globally, more than 1 million curable sexually transmitted infections (STIs) occur each day [9]. Of all the major health threats to emerge since the start of this century, none has challenged the very foundations of public health as profoundly as the rise of chronic non-communicable diseases. The prevalence of heart disease, cancer, diabetes, and chronic respiratory diseases, once considered the close companions of affluent societies, is now global, with the heaviest burden concentrated in low- and middle-income countries [10].

A previous study carried out in United States found that the prevalence of multiple risk behaviors increased dramatically with age, with only 1 in 12 adolescents aged 12-13 years engaging in two or more health risk behaviours and one-half of the college-aged youth (18-21 years) engaging in two or more of these behaviours[11]. Also,another similar study carried out in Brazil found that approximately 58.5% of adolescents reported being exposed to at least two health risk behaviors simultaneously [12].Furthermore, a review study carried out on UK based cross-sectional and longitudinal studies on risk behaviours among young people found that for young adults, there was evidence of clustering between sexual risk behavior and smoking, sexual risk behavior and illicit drug use, and sexual risk behavior and alcohol misuse [13].

The co-occurrence of health risk behaviours among young people has been reported in some other countries around the world [14], [15]. However, limited information exist on the co-occurrence of two or more health risk behaviours among undergraduates in tertiary institutions in Nigeria. This study therefore sort to investigate the prevalence of the co–occurrence of health risk behaviours among undergraduates in a tertiary institution in Nigeria. The objectives of this study were to identify: the current prevalence of four selected health risk behaviours: namely; alcohol drinking, cigarette smoking, having multiple sexual partners and non-condom use as well as the prevalence of co–occurrence of these health risk behaviours. The pattern of clustering of the health risk behaviours and gender differences in the co-occurrence of the selected health risk behaviours among undergraduates of Obafemi Awolowo University, Ile – Ife, Nigeria will also be assessed.

II MATERIALS AND METHODS

A. Study Design

A descriptive cross-sectional study design was employed [16].A list of the total number of faculties, departments and the total number of enrolled undergraduate students were obtained from the student affairs division of the Obafemi Awolowo University, Ile – Ife, Nigeria and was used to compute a sample size of 600 students (400 males and 200 females).

B. Inclusion and Exclusion Criteria

The inclusion criterion was all undergraduate students of Obafemi Awolowo University while age below 10 years and above 24 years were exclusion criteriabecause the age range for young people according to World Health Organization (WHO) is from the age of 10 to the age of 24 [17]. Married undergraduate students were also excluded from the study because their sexual and other risk behaviour patterns may be different from that of unmarried undergraduates [18].

C. Sampling Technique

A multistage sampling techniqueinvolving four stages was used to select the 600 respondents for this study [19]:1st stage: Stratified random sampling was used to group all the faculties into four broad clusters and one faculty was randomlyselected from each cluster. 2nd stage: Five departments were randomly selected from each faculty using simple random sampling method. 3rd stage: Two levels of study were randomly selected from each department using simple random sampling method. 4th stage: Fifteen participants were randomly selected from the class lists of each selected level by stratified random sampling by gender using a ratio of 2 males: 1female. This ratio was used order to reflect the likelihood of sampling each male and female student and thereby reduce bias by compensating for the differences in the populations of male and female students.

D. Data Collection and Questionnaire Design

Pre-tested, self-administered and anonymous questionnaire was used to collect information from respondents. It was adapted from the 2011 State and Local Youth Risk Behaviour Surveys in United States. The indicators / measures of risk behaviours in this study were constructed to parallel past research on co-occurring health risk behaviours in adolescence and young adulthood. The instrument measured socio-demographic variables and current indulgence in the selected health risk behaviours, namely; cigarette smoking, current alcohol drinking, having multiple sexual partners and non-condom use [20].

F. Data Analysis

SPSS statistical software was used for data entry and data analysis. A descriptive statistics of the socio-demographic variables, each selected health risk behavior and the different clusters of co-occurring two, three and four health risk behaviours stratified by gender were evaluated and expressed in percentages.Comparative analyses were conducted with Pearson Chi-Squared (χ^2) test to assess the relationship between gender and each cluster of co – occurring health risk behaviours as well as individual health risk behaviour. The statistical level of significance was set at $p < .05$.

G. Ethical Consideration

Ethical clearance was obtained from Obafemi Awolowo University Teaching Hospital Complex Ethics and Research Committee. Consent was sought and obtained from each participant before questionnaire administration and they were assured of confidentiality. In order to ensure confidentiality, anonymous questionnaire was used to obtain relevant data from the respondents and adequate privacy for each respondent was ensured in completing the questionnaire.

III. RESULTS

A. Socio-demographic Characteristics

Table 1 shows the socio-demographic characteristics of the respondents. Overall, the proportion of males in each age category and level of study was more than the proportion of females. A greater percentage of the respondents (68.1%) fell within the 20 - 24 years age bracket.

TABLE I

SOCIO-DEMOGRAPHIC CHARACTERISTICS

Variables	Male N (%)	Female N (%)	Total N (%)
Gender	400	200	600
Age category (Years)			
16 – 19	130 (32.50)	61 (30.50)	191 (31.8)
20 – 24	270 (67.50)	139 (69.5)	409 (68.2)
Year of study			
1st Year	120 (30.00)	60 (30.00)	180 (30.00)
2nd year	90 (22.50)	45 (22.50)	135 (22.50)
3rd year	60 (15.00)	30 (15.00)	90 (15.00)
4th year	110 (27.50)	55 (27.50)	165 (27.50)
5th year	20 (5.00)	10 (5.00)	30 (5.00)

N = Number of occurrence

B. Prevalence of Each Selected Health Risk Behaviour

The prevalence of each selected health risk behavior is presented in Table II. The health risk behavior with the highest prevalence among both male and female respondents was current alcohol drinking.

TABLE II

PREVALENCE OF EACH HEALTH RISK BEHAVIOURS

Selected health risk behaviours	Males =400 N (%)	Female =200 N (%)	Total = 600 N (%)	*P*- value
Current cigarette smoking	96 (16.00)	19 (3.20)	115 (19.20)	< .001
Current alcohol drinking	218 (36.30)	84 (14.00)	302 (50.30)	.004
Current non-condom use	132 (22.00)	39 (6.50)	171 (28.50)	< .001
Having multiple sexual partners	111 (18.50)	37 6.20)	148 (4.70)	< .001

N= Number of occurrence

C. Prevalence of Exclusively Only One Health Risk Behaviour

The result presented in Table III shows the number of respondents who engaged exclusively in only one of the selected health risk behahiours. Compared with Table II, a marked reduction in the prevalence of each health risk behavior was observed. This is becausemost of the respondents that reported engaging in each health risk behaviour in Table II also engaged in other health risk behaviours.

TABLE III

PREVALENCE OF ONLY ONE HEALTH RISK BEHAVIOUR EXCLUSIVE OF THE OTHERS

Selected health risk behaviours	Males = 400 N (%)	Female = 200 N (%)	Total = 600 N (%)	*p*-value
Cigarette smoking only	13 (3.25)	2 (1.00)	15 (2.50)	>.05
Alcohol drinking only	49 (12.25)	34 (17.00)	83 (13.83)	>.05
Non-condom use only	20 (5.00)	7 (3.50)	27 (4.50)	>.05
Having multiple sexual partners only	12 (3.00)	9 (4.50)	21 (3.50)	>.05
Prevalence of one health risk	94 (23.50)	52 (26.00)	146 (24.33)	>.05

N= Number of occurrence

D. Different Patterns of Clustering of Exclusively Two Co-occurring Health Risk Behaviours

Shown in Table IV are the different clusters of two co-occurring health risk behaviours reported by the respondents. Each cluster of two co-occurring health risk behavior is exclusive of the other health risk behaviors selected for this study. The cluster of two co-occurring health risk behaviors with the highest prevalence was current alcohol drinking and non-condom use ($A+N^1$).

TABLE IV

DIFFERENT PATTERNS OF CLUSTERING OF EXCLUSIVELY TWO CO-OCCURRING HEALTH RISK BEHAVIOURS

2 Co-occurring health risk behaviours	Males = 400 N (%)	Female = 200 N (%)	Total = 600 N (%)	*p* - value
A + C only	33 (8.25)	5 (0.80)	38 (6.50)	.006
A + M only	23 (5.75)	8 (1.20)	31 (5.20)	> .05
A + N^1 only	42 (10.5)	13 (2.00)	55 (8.80)	> .05
C + M only	5 (1.25)	0 (0.00)	21 (3.50)	> .05
C + N^1 only	1(0.25)	52 (8.70)	146 (24.30)	> .05
M + N^1 only	7 (1.75)	2 (1.00)	9 (1.50)	> .05
Total prevalence of two co-occurring health risk behaviours	111 (27.75)	29 (14.50)	140 (23.33)	< -001

N = number of occurrence, A = current alcohol drinking; C = current cigarette smoking, M = Having multiple sexual partners; N^1 = Non-condom use

E. Different Patterns of Clustering of Exclusively Three Co-occurring Health Risk Behaviours

The various cluster of three co-occurring health risk behaviours reported by the respondents is presented in Table V. Each cluster of health risk behavior is exclusive of the other health risk behaviors selected for this study. That is if a respondent engages in any additional health risk behavior different from the ones in each cluster in the table below, such a respondent is excluded from that cluster. The three co-occurring health risk behavior cluster with the highest prevalence among male and female respondent was alcohol drinking + having multiple sexual partners + non-condom use cluster (A+M+N).

TABLE V

DIFFERENT PATTERNS OF CLUSTERING OF EXCLUSIVELY THREE CO-OCCURRING HEALTH RISK BEHAVIOURS

3 Co-occurring health risk behaviours	Males = 400 N (%)	Female = 200 N (%)	Total = 600 N (%)	*p* - value
A + C + M only	15 (3.75)	4 (2.00)	19 (3.17)	> .05
A + C + N only	12 (3.00)	3 (1.50)	15 (2.50)	> .05
A + M +N^1 only	28 (7.00)	14 (7.00)	42 (7.00)	> .05
C + M + N^1 only	2 (0.50)	0 (0.00)	2 (0.03)	> .05
Total prevalence of three co-occurring health risk behaviours	57 (14.25)	21 (10.50)	78 (13.00)	< .05

N = number of occurrence, A = current alcohol drinking; C = current cigarette smoking, M = Having multiple sexual partners; N^1 = Non-condom use

F. Cluster of Four Co-occurring Health Risk Behaviours

The prevalence of co-occurrence of all the selected four health risk behaviours is presented in Table VI. No

female respondent was found in this cluster of four co-occurring health risk behaviours

TABLE VI

FOUR CO-OCCURRING HEALTH RISK BEHAVIOURS

4 Co-occurring health risk behaviours	Males = 400 N (%)	Female = 200 N (%)	Total = 600 N (%)	*p* - value
A + C + M + N	19 (4.75)	0 (0.00)	19 (3.16)	.001

N = number of occurrence, A = current alcohol drinking; C = current cigarette smoking, M = Having multiple sexual partners; N^1 = Non-condom use

G. Summary of the Prevalence of Co-occurrence of Selected Health Risk Behaviours

A summary of the prevalence of co-occurrence of the selected health risk behaviors as well as the prevalence of one health risk behavior and no health risk behavior among the respondents for this study is presented in Table VII. Compared to the proportion of respondents that engaged in one health risk behavior, a greater proportion of the respondents engaged in at least two health risk behaviours. Table VII shows a high prevalence of co-occurring health risk behaviors among the respondents. However, about one-third of the respondents reported not engaging in any of the selected health risk behaviors.

TABLE VII

SUMMARY OF PREVALENCE OF CO-OCCURRING HEALTH RISK BEHAVIOURS

Co-occurring Health Risk Behaviour	Males = 400 N (%)	Female = 200 N (%)	Total = 600 N (%)	*p* - value
No risk	119 (29.75)	98 (49.00)	217 (36.16)	<.001
One risk	94 (23.50)	52 (26.00)	146 (24.33)	> .05
Two risk	111 (27.75)	29 (14.50)	140 (23.33)	<.001
Three risk	57 (14.25)	21 (10.50)	78 (13.00)	> .05
Four risk	19 (4.75)	0 (0.00)	19 (3.16)	< .001
At least two risk	187 (46.75)	50 (25.00)	237 (39.49)	<.001

N = number of occurrence

IV. DISCUSSION

In young adulthood, people engage in health risk behaviors which result in consequences such as communicable and non-communicable diseases episodes later in life. Non-communicable diseases (NCDs) kill 41 million people each year Over 85% of these "premature" deaths occur in low- and middle-income countries. Cardiovascular diseases account for most NCD deaths, or 17.9 million people annually, while 3.9 million people die annually due to respiratory diseases. Alcohol drinking and cigarette smoking are health risk behaviours for cardiovascular diseases and respiratory diseases [8]. Also, globally, more than 1 million curable sexually transmitted infections (STIs) occur each day [9]. Hence, the need to study the risk factors that predisposes individual to these diseases and infections are of paramount importance.

This present study corroborates the result of previous studies on clustering of health risk behaviours among young people [12], [13]. For instance, in the study carried out by Meader et al. [13], there was a relatively strong evidence of clustering between alcohol misuse and smoking; sexual risk behaviour and smoking; sexual risk behaviour and illicit drug use; and sexual risk behaviour and alcohol misuse among young people. This was also observed in this present study. On the other hand, a study carried out by Brito et al. [12], found a higher prevalence of co-occurrence of at least two health behaviors (58.5%) while in this present study,a prevalence of 39.49% for the co-occurrence of at least two health behaviors was found. The differences notwithstanding, a common line of co-occurrence of health risk behaviours among young people irrespective of geographical location can be drawn from this present study and similar previous studies.

Gender differences also existed in the pattern of co-occurrence of the selected health risk behavior for this study. For instance, no female respondent was found in the four co-occurring health risk behavior cluster whereas 3.2% male respondents reported engaging in all the four health risk behaviours. Gender differences in the co-occurrence of health risk behaviours have also been reported in previous studies [21], [22].Furthermore, although eleven clusters of co-occurring health risk behaviours were identified, however, the cluster with the highest prevalence was alcohol drinking and non-condom use (8.8%) and more males were also found in this cluster than females.The center for disease control and prevention has identified substance use as a risk factor for HIV [23] and alcohol use has been reported to impair judgment during sexual intercourse, potentially decreasing the likelihood of condom use [24].A previous study that investigated the relationship between substance use and sexual behaviour in young people in Britain found that men and women reporting frequent binge drinking or recent drug use were more likely to report unprotected first sex with ≥1 new partner(s), and sexually transmitted infection diagnosis/es and associations with sexual risk were frequently stronger for those reporting multiple substance use, particularly among men [25]. There is growing evidence to support no safe threshold for alcohol consumption [26[. However, the alcohol industry continues to invest substantial sums of fiscal resources in lobbying and advertisement in the U.S. and abroad [27].

Overall, the prevalence of at least two health risk behaviours in an individual (39.49%) was higher than the prevalence of one risk (24.33%) in this present study. Importantly, this suggests that risk behaviours do not always occur in isolation rather they co-occur in most individuals [28]. Literature has shown extensively that engaging in two or more health risk behaviours poses a threat to the current and later health of young people and might result in acquiring communicable and/or non-communicable diseases [29], [30].

V. CONCLUSION

This study reports a co-occurrence of health risk behaviours for communicable and non-communicable diseases among young undergraduates of Obafemi Awolowo University, Ile – Ife, Nigeria. This may have implication for health promotion and education programmes among young people.

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