

Gender Differences in Dietary Behaviours, Health-Related Habits and Prevalence of Non-Communicable Diseases: A Cross-Sectional Study in Botswana

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Abstract

Background

There is scanty information regarding sex or gender differences in health-related habits, NCD risk factors, and prevalence of NCDs in Botswana. The purpose of this study is to assess the influence of gender differences on health-related habits, weight status, common NCD risk factors, and on the prevalence of non-communicable diseases.

Methods

A cross-sectional, population-based survey called the Botswana STEPS Survey II which was conducted in 2014 based on people aged 15–64 years. The survey used a multi-stage cluster sampling methodology to arrive at nationally representative sample. As such during analysis of data, a complex sample module from SPSS was adopted to account for the multiple stages of sampling. The predicted probabilities of outcome variables were derived by controlling the covariates. A total sample size of 2947 participants aged 25–64 years were used in this study.

Results

The study results showed that a statistically significant high predicted percentage of men compared to women smoked tobacco (34.4%, 95% CI: 33.5–35.1 vs. 4.4%, 95% CI: 4.3–4.5). Men were also consistently engaging in heavy alcohol use and low consumption of fruit and/or vegetables, and these differences were statistically significant. On the other, physical inactivity among women was higher than men. Controlling other covariates, a higher predicted probability of women than men were overweight (28.7%, 95% CI: 28.6–28.8 vs. 18.3%, 95% CI: 18.0–18.6) and obese (25.8%, 95% CI: 25.4–26.2 vs. 10.2%, 95% CI: 9.9–10.5). Women are at the greater risk of developing NCDs compared to men since the adjusted prevalence of at least 3 common risk factors were more among women than men. A higher adjusted predicted prevalence of women than men suffered from hypertension (39.4%, 95% CI: 38.9–40.0 vs. 26.1%, 95% CI: 25.5–26.8).

Conclusions

Overall, the study observed that there were gender differences in health-related habits, malnutrition, NCD risk factors and NCD prevalence. Appropriate policies and programmes need to be adopted in order to urgently address the problem of NCDs.

Introduction

Dietary habits are strongly influenced by gender attitudes and behaviours and these habits in turn promote differential disease risks between men and women [1]. Gender-specific attitudes and behaviours towards eating are often reflected by the food intake pattern. For instance, the consumption of red meat and larger portions are often associated with masculinity, while vegetables, fruit, fish, and dairy products such as yogurt and cottage cheese are associated with femininity [2–5]. Women engage in health-promoting behaviours and have healthier lifestyle patterns than men [1]. Literature also shows that women show dietary restraint and disinhibition levels than men [6]. Evidence coming from the United States of America and Europe indicate that there is a tendency for women consume more fruit and vegetables, legumes and whole food while men tend to consume more sweets and cakes [7]. In general, there is a tendency for men to eat food richer in fats and proteins, to drink more wine, beer, spirits and sweet carbonated drink; the dietary behaviours that favour the risk of overweight and obesity [7]. People, particularly, young ones, irrespective of their genders, portray unhealthy dietary habits such as the non-consumption of the recommended five or more servings of fruit and vegetables every day, consumption of little milk and dairy products, skipping meals and frequently eating energy-dense nutrient-poor fast-and ready-to-eat foods [8, 9].

There is ample evidence from numerous epidemiological and clinical studies that strongly demonstrate that lifestyle represents a key determinant of health, in particular unhealthy diet, lack of sufficient physical activity, heavy alcohol consumption, and tobacco use [1, 10]. The analysis of high-risk behaviours indicates that gender attitudes and behaviours promote different patterns of healthy or unhealthy lifestyles among women and men [11, 12]. Evidence from previous studies show that women consume more fruit and vegetables and tend to have more interest in healthy diets and a desire to eat food lower in energy than men [13, 14]. Apparently males eat anything to fulfil their hunger [13] and eat very fast and large quantities of food [15]. Other studies have shown that students, regardless of the gender, generally, show a sufficient knowledge of what a “healthy diet” means, but girls appeared more prone to make positive changes in nutrition and physical activity levels to ameliorate their own lifestyle [16–18].

Research evidence has also shown that the burden of non-communicable diseases (NCDs) is not only unequally distributed among different social classes, but their risk factors also show variation by gender [19–21]. Studies from Western countries show gender differences in food consumption, nutrient intake and attitudes towards food [22]. Women are more concerned about healthy diet and more often classify foods according to the assumed nutrient content than men [14, 23]. Women do not only take care of their own diet but also of the food choices and health of their families [24, 25]. Men consume more meat, potatoes, bread and alcohol but less fruits, vegetables, fish, chicken, cheese and sweets than women [22].

Previous research has shown that gender is an important consideration because men and women have biological/physiological differences and have different levels of exposure and vulnerabilities. For example, World Health Organisation (WHO) indicated that in many low- and middle-income countries (LMICs), the low socio-economic, legal and political status of girls and women is increasing their exposure and vulnerability to the risk factors of NCDs [26]. WHO has argued that the leading cause of

death for women is NCDs which account for 65% of all female deaths and that translates into 18 million deaths each year. NCDs kill more than 36 million people annually with close to 80% of NCD deaths taking place in LMICs. Most of the NCD deaths (17 million people) annually are accounted for by cardiovascular diseases, followed by cancers which account for 7.6 million, respiratory diseases (4.2 million), and diabetes (1.3 million) [27]. All of the above-mentioned four diseases share four risk factors, which are tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets (African Union 2013). Most of the NCDs are preceded by unhealthy behaviours (behavioural risk factors), followed by the emergence of metabolic risk factors. Other risk factors which are biochemical processes involved in the body's normal functioning include raised blood pressure, overweight/obesity, raised blood glucose and raised cholesterol [27–28].

In Botswana, studies have demonstrated gender differences in NCDs prevalence and their risk factors. One study has observed that for males, the prevalence of hypertension was high among those who were obese (31.1%) than those who were not (8.6%) [29]. The study also found that for females, hypertension was more pronounced in those who were obese (29.1%) than those who were not (15.6%). Studies have shown that gender roles affect health, and these roles can be modified by information, educational and communication approaches that promote healthy eating habits [30]. Therefore, it is critical to consider gender norms when designing and developing interventions that address nutritional issues [1]. Since most of the studies evaluating dietary habits have been conducted in United States of America and Europe, it is inappropriate to extrapolate those results to other countries which are geographically and culturally different from them [7]. In this context, the aim of this study is to assess the influence of gender differences on health-related habits, weight status, common NCD risk factors, and on the prevalence of NCDs. It is hoped that information generated by this study will allow for the identification of health-related problems that can be addressed through health education programmes.

Methods

Study design

The current analysis is derived from a cross-sectional, population-based survey called the Botswana STEPS Survey II which was conducted in 2014 based on people aged 15-69 years. The survey used a multi-stage cluster sampling methodology to arrive at nationally representative sample. A detailed report on the methodology of the Botswana STEPS Survey has been presented elsewhere [31].

Data

This study is based on secondary data analysis of the population-based 2014 Botswana STEPS survey. Because the sampling design includes more than one stage of sampling, sample weights were used to adjust for differential selection probabilities.

Sampling procedure

Since a multi-stage stratified sampling procedure was used in the 2014 Botswana STEPS Survey, the use of standard statistical methods for analyzing the data would produce unreliable estimates of the desired parameters. As such during analysis of data, a complex sample module from SPSS was adopted to account for the multiple stages of sampling. The target sample size for the 2014 Botswana STEPS Survey was 6410 but 4074 individuals (age group 15-64) participated, yielding an overall response rate of 64% [31]. For this study, 2549 respondents in the age group 25-64 were used.

Measures

Primary and secondary NCD risk factors

All the measures discussed below were assessed using the WHO standard questionnaire.

Tobacco use: Tobacco use was measured as the percentage who current smoke any tobacco products such as cigarettes, cigars or pipes.

Alcohol use: Alcohol consumption was assessed using the concept of 'standard drinks'. A standard drink is any alcoholic drink containing 10 grams of pure alcohol, ethanol. *Binge drinking* was assessed as consuming 6 or more standard drinks on one occasion for both males and females.

Consumption of fruit and/or vegetables: Consumption of fruits and vegetables was assessed in terms of 'number of servings'. Show-cards were used to collect data on fruit and vegetable consumption on a typical day. This variable was computed as the percentage of respondents who had less than 5 servings of fruit and/or vegetables on average per day.

Physical Inactivity: Respondents who, in a typical week, engaged in any physical activity such as work, travel to and from places, and/or recreational activities reported the number of days and the amount of time spent doing those activities. This variable was computed using total physical activity metabolic equivalent (MET)-minutes per week of less than 600. Physical inactivity measures the percentage of respondents who do not meet WHO recommendations on physical activity for health of at least 600 MET-minutes per week.

Body mass index: Body mass index (BMI) is derived from a ratio of weight in kilograms divided by height in metres squared. Height was measured in centimetres during the survey but was later converted to metres during the analysis. Height was restricted to 1.0 m to 2.7 m while weight was restricted to 20kg to 350 kg as per the recommendation of the World Health Organisation. In this study, BMI is categorized into four groups as per WHO recommendations: underweight ($BMI < 18.5 \text{ kg/m}^2$), normal ($18.5 \text{ kg/m}^2 \leq BMI < 25 \text{ kg/m}^2$), overweight ($25 \text{ kg/m}^2 \leq BMI < 30 \text{ kg/m}^2$), and obese ($BMI \geq 30 \text{ kg/m}^2$).

Multiple NCD risk factors: Multiple NCD risk factors is composed of five risk factors, namely, daily smoking, consuming less than 5 servings of fruit and vegetables per day, low physical activity, high body mass index (≥ 25), and arterial hypertension (SBP ≥ 140 or DBP ≥ 90 mm Hg or those who are currently on hypertension medication). The percentage with 0 risk factors are respondents with none of the

common risk factors; 1-2 risk factors means respondents have risks for developing NCDs; and 3-5 risk factors means high risks for developing NCDs.

Socio-demographic variables

The independent variables used for analysis in this study were selected on the basis of literature review and on the availability of the limited socio-demographic variables collected by the 2014 Botswana STEPS survey. The following variables were collected in the survey: gender, age, nationality, and work. Age was categorized as follows: 25-34, 35-44, 45-54 and, 55-64 years. Nationality variable was created into two categories, Motswana or others. Work status was created into two categories as working or not working. Participants who described their main work status over the past year as government employee, parastatal, non-governmental employee, self-employed were classified as working and those in non-paid/unpaid family helper, student, homemaker/housework, retired, unemployed (able to work), and unemployed (unable to work) as not working.

Statistical Analysis

Separate binomial logistic regression model were used for the dichotomous variables such as tobacco use, heavy episode of alcohol drinking, insufficient fruits and vegetable consumption, physical inactivity, hypertension, diabetes, cholesterol and angina. Ordinal logistic regression model was used for the outcome variable BMI category. Multinomial logistic regression model was used for the outcome variable with multiple risk factors categorized as three. In all the models the covariates such as age, gender, education and work status have been included. The predicted probabilities (given in terms of percentages) for males and females were presented for studying the gender differentials. All the statistical analyses were done in SPSS version 25.

Ethical considerations

The study used secondary data from the Botswana STEPS Survey II which was conducted in 2014 by WHO and Ministry of Health and Wellness. All ethical formalities for the STEPS survey II were therefore handled by WHO and Ministry of Health and Wellness.

Results

Socio-demographic characteristics of the sample

Table 1 presents the socio-demographic characteristics of the selected sample. A total of 2947 respondents were selected for the study comprising more than two-thirds of females, slightly more than a tenth had no education, about a third of the respondents aged 25–34 years, approximately 96% of the respondents being Botswana, and 54% not working.

Table 1
Socio-demographic characteristics of the respondents, Botswana STEP Survey, 2014

Characteristics	Percent	Number
Gender		
Male	31.4	925
Female	68.6	2022
Education		
No education	12.1	357
Primary	27.7	816
Secondary	39.5	1165
Tertiary and higher	20.7	609
Marital status		
Currently married	36.3	1070
Formerly married	7.9	232
Never married	55.8	1645
Age group		
25–34	36.0	1061
35–44	26.2	771
45–54	18.8	554
55–64	15.3	450
Nationality		
Motswana	96.1	2832
Others	3.9	115
Working status		
Working	45.8	1351
Not working	54.2	1596
Total	100.0	2947

Physical activity, smoking status, alcohol consumption and fruit and vegetable consumption patterns

The predicted probabilities from Table 2 shows that tobacco use between males and females is statistically different, 34.3% (95% CI: 33.3–35.1) and 4.4% (95% CI: 4.3–4.5), respectively. Males tended to engage more in heavy episodic drinking than females (21.6% vs. 8.8%, respectively), and this gender differential was statistically significant. It is also evident that the majority of both males and females did not consume sufficient fruit and/or vegetables on average per day, 96.1% versus 94.2% respectively. About 31.3% of females compared to 24.2% of males engaged in insufficient physical activity, i.e. less than 600 MET-minutes per week. This gender differential was statistically significant at 95% level.

Table 2

Predicted probabilities (%) showing gender differences in tobacco use, alcohol consumption and insufficient fruit and vegetable consumption and physical inactivity, Botswana 2014

Health-related habits domains	Male	Female	Total
	% (95% CI)	% (95% CI)	% (95% CI)
Use tobacco	34.3 (33.3–35.1)	4.4 (4.3–4.5)	13.9 (13.3–14.5)
Consumed 6 or more alcoholic drinks on any occasion in the past 30 days (Heavy episodic drinking)	21.6 (21.1–22.1)	8.8 (8.7–9.0)	12.9 (12.6–13.2)
Consume less than 5 servings of fruit and vegetables on average per day	96.1 (95.9–96.2)	94.2 (94.1–94.4)	94.8 (94.7–94.9)
Insufficient physical activity (defined as < 600 MET-minutes per week)	24.2 (24.0–24.4)	31.3 (31.1–31.4)	29.0 (28.8–29.2)
Note: Predicted probabilities were derived for each outcome variables using the binary logistic regression model controlling for age, gender, education and works status.			

Weight status based on BMI by gender

Table 3 presents weight status of the study participants based on BMI classification and also the predicted probabilities by gender. From this table, females weighed heavier than their male counterparts as shown by the overall BMI. The average BMI for females was about 27 kg/m² compared to 23 kg/m² for males. About 29% of females were shown to be overweight compared to 18% of males and another 26% of females were obese compared to only 10% of males. Overall, about 55% of females were overweight or obese compared to only 29% of males who were overweight or obese.

Table 3
Weight status measured by BMI by sex, Botswana 2014

Characteristic	Male	Female	Total
	Mean ± S.E.	Mean ± S.E.	Mean ± S.E.
Age (years)	38.6 ± 0.52	40.2 ± 0.39	39.4 ± 0.35
Weight (kg)	67.4 ± 1.37	68.4 ± 0.64	67.9 ± 0.77
Height (cm)	171.1 ± 0.00	161.0 ± 0.00	166.2 ± 0.00
BMI, weight ((kg)/height (m ²))	23.0 ± 0.43	26.5 ± 0.24	24.7 ± 0.26
Predicted probabilities (%) *			
BMI category	% (95% CI)	% (95% CI)	% (95% CI)
Underweight	16.0 (15.6–16.3)	5.7 (5.6–5.8)	9.0 (8.7–9.2)
Normal weight	55.6 (55.3–55.8)	39.8 (39.4–40.1)	44.8 (44.4–45.1)
Overweight	18.3 (18.0–18.6)	28.7 (28.6–28.8)	25.4 (25.2–25.6)
Obese	10.2 (9.9–10.5)	25.8 (25.4–26.2)	20.9 (20.5–21.3)
Notes: BMI = Body mass index; S.E. = Standard error; CI = Confidence interval. *Predicted probabilities were derived for BMI outcome variable using the ordinal logistic regression model controlling for age, gender, education and work status.			

Prevalence of combined NCD risk factors by gender

Table 4 shows the predicted probabilities of females and males who are exposed to the risk of becoming ill with non-communicable diseases. Overall, only 3.5% of the adults had no common NCD risk factor and there was no gender difference evident. Approximately 28% of males had 3–5 of the common risk factors compared to 32.2% of females and this gender difference was statistically significant at 95% level.

Table 4

Predicted probabilities (%) showing gender differences in multiple NCD Risk factors (among adults aged 25–64 years), Botswana, 2014

NCD risk factors	% (95% CI)		
	Male	Female	Total
<i>none of the risk factors</i>	3.5 (3.4–3.5)	3.5 (3.4–3.6)	3.5 (3.4–3.5)
<i>With 1–2 of the risk factors</i>	68.5 (67.9–69.9)	64.2 (63.8–64.7)	65.5 (65.2–65.9)
<i>With 3–5 of the risk factors</i>	28.1 (27.5–28.7)	32.2 (31.8–32.7)	30.9 (30.6–31.3)

Note: NCD common risk factors are: current daily smokers; consuming less than 5 servings of fruit &/or vegetables per day; low level of physical activity; overweight (BMI = > 25 kg/m²); and raised BP (SBP = > 140 and/or DBP = > 90 mmHg or currently on medication for raised B). Predicted probabilities were derived for multiple risk factor outcome variable using the multinomial logistic regression model controlling for age, gender, education and works status

Prevalence of non-communicable diseases by gender

NCDs are quite prevalent in Botswana, with hypertension being the most frequently reported NCD. The problem of NCDs appeared to be more prevalent among females than males according to Table 5. A higher proportion of females compared to males reported hypertension (39.5% (95% CI: 38.9–40.0) vs. 26.1 (95% CI: 25.5–26.8). About 8% of the respondents reported having diabetes, with no gender differentials. The adjusted cholesterol prevalence was reported more by females than males, 21.3% vs. 15.6% respectively. However, all these gender differentials were not statistically significant except for hypertension.

Table 5

Predicted probabilities showing gender differences in non-communicable diseases by gender, Botswana 2014

Non-communicable disease	Male	Female	Total
	% (95% CI)	% (95% CI)	% (95% CI)
Hypertension	26.1 (25.5–26.8)	39.5 (38.9–40.0)	35.3 (34.8–35.8)
Diabetes	7.7 (7.3–8.1)	7.8 (7.5–8.1)	7.8 (7.5–8.0)
Cholesterol	15.6 (15.1–16.1)	21.3 (20.9–21.7)	19.5 (19.1–19.6)
Angina or stroke	5.0 (4.9–5.1)	6.3 (6.2–6.4)	5.9 (5.8–5.9)

Predicted probabilities were derived for each outcome variables using the binary logistic regression model controlling for age, gender, education and works status.

Discussion

The results from this study indicated that dietary behaviours, malnutrition, combination of common NCD risk factors, and the prevalence of NCDs differed by the gender. Regarding the prevalence of four common NCD risk factors, men tended to use tobacco more than women and this finding was statistically significant. This finding possibly emanates from the societal acceptance that it is “cool” for men to use tobacco than it is for women, partly because smoking among females is considered undesirable. WHO reports that tobacco use among women is increasing in some countries. Males also tended to report high levels of alcohol consumption compared to their female counterparts. There were no gender differentials with regard to fruit and/or vegetable consumption. A large proportion of Botswana’s population hardly consume sufficient fruit and/or vegetables and therefore less variability among gender. WHO recommends the consumption of at least 5 servings of fruits and/or vegetables on average per day and the current study results showed that fruit and/or vegetable consumption is very low in Botswana. Unlike Botswana, gender differences in dietary behaviour were documented in other studies. For instance, studies have shown that women eat more fruits, vegetables, cereal products, milk dairy and whole grain than men [3, 32, 33]. The consumption of red meat, eggs, alcohol, soft drinks and various high starch foods such as potatoes and bread however is higher in men [22, 33–36]. Gender difference from previous research also demonstrated that female-headed households allocated a significantly larger share of their budget to fruit and vegetables than male-headed households [37] which buttresses the idea that more women than men consume fruit and/or vegetable.

According to the study results, approximately 30% of the respondents were not engaging in physical activity that exceeds 600 MET-minutes per week, implying that these respondents were not meeting the minimum recommended amount of physical activity for health promotion. WHO states that physical activity reduces the risk of coronary heart disease and stroke, diabetes, hypertension, various types of cancer including colon cancer and breast cancer, as well as depression [38]. Lack of physical activity as shown by the current study results implies that Botswana can expect to see an increase in the prevalence of the above-mentioned NCDs in the foreseeable future partly because of the low proportion of the population that is physically active. The WHO Global Action Plan target of 10% reduction in the prevalence of physical inactivity [38] may not be achievable in the country unless deliberate, effective and intensive strategies are adopted and implemented immediately.

As regards secondary NCD risk factors, the results of this study demonstrated that females weighed heavier than men. Females were either overweight or obese compared to their male counterparts and this gender difference was statistically significant. This study finding which demonstrates that women had a higher overweight/obese prevalence relative to men is consistent with other studies [39]. The overweight/obese phenomenon in Botswana could be attributable to the cultural ideal body size of a beautiful woman. It is not unusual for men to view an overweight woman as very beautiful and socially acceptable and desirable. The emergent overweight/obese phenomenon could also be explained by the change from traditional diets composed of whole foods such as whole grains and traditional fruit consumption to an energy-dense and nutrient-poor diet of refined carbohydrates, high fat intake, and processed foods due to less physical activity [39–41]. It has been observed that added sugars are a

dietary driver of obesity worldwide, especially when consumed in beverages such as soft drinks, sweetened coffee and tea, juices, and alcoholic beverages [41].

Food choices are influenced by context, consumers' experiences and consumers' preferences [42]. Nine distinct factors influencing an individual in food selection are: health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity, and ethical concerns [43]. Men in Botswana generally consume large amounts of meat, particularly beef and this tradition has been passed on from one generation to the next. The study finding on gender differences in food consumption patterns appear to be consistent with previous research that found the consumption of meat symbolizes a masculine diet [42]. Previous research has also shown that women have a higher awareness and better knowledge of nutrition than men [42].

The multiple risk factor study result demonstrated that a higher proportion of male adults compared to females were at a higher adjusted prevalence of 1–2 risk factors, however, females have greater risk of 3–4 factors compared to males. The gender differences were statistically significant at 95% level. This elevated NCD risk for men is driven by the fact that males were more likely to smoke tobacco products, were more likely to consume large amounts of alcohol, and were less likely to consume sufficient fruits and vegetables. This study also found that the adjusted prevalence of NCDs is generally high among females than males but significant only in the case of hypertension. In particular, the adjusted prevalence of hypertension was significantly higher for females (39.5%) compared to males (26.1%).

The current study has some limitations. First, the data used in the study is cross-sectional, therefore implying that no causal conclusions can be drawn from the study results. Second, the data lacks some key variables such as wealth status that are known to influence variables such as weight gain and fruit and vegetable consumption. However, the study used a nationally representative sample across Botswana which strengthens our evidence base.

In order to address the problems of high proportions of smoking, harmful use of alcohol, low fruit and/or vegetable consumption, increasing proportions of men and women who are overweight and obese, and the rising prevalence of NCDs, appropriate policy and programme interventions need to be adopted and implemented with immediate effect. Intensive awareness campaigns and legislative measures such as tobacco taxation need to be strengthened and implemented. Health promotion messages that can promote healthy living need to be implemented. Instead of using traditional and standard modes of communication such as radios and pamphlets, innovative technologies such as mobile phones can be used to disseminate health promotion messages. Social media is used widely in Botswana to the extent that health promotion messages sent through that media will have great reach and coverage.

Conclusions

Overall, the study observed that there were gender differences in health-related behaviours, malnutrition, NCD risk factors and NCD prevalence. Consistent with previous research from other countries in the less developed world, men engaged in lifestyle and dietary behaviours that increased their risk of developing

NCDs. However, women experienced higher levels of overweight and obesity while men experienced higher levels of underweight. The combined risk factors for NCDs showed that women were at a higher risk of developing NCDs than men. It could be that due to higher prevalence of overweight and obesity, women were more likely to have raised blood pressure than men. Appropriate policies and programmes need to be adopted to urgently address the problem of NCDs.

Abbreviations

BMI- Body Mass Index

CI- Confidence Interval

LMICs-low- and middle-income countries

MET- Metabolic equivalent

NCDs- Non communicable diseases

SPSS- Statistical Package for Social Sciences

WHO- World Health organization

Declarations

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Authors' contributions

GL conceived the study, did the initial analysis and wrote the first draft of the manuscript. MK, KN and KM assisted in the analysis, interpreting the results, writing and reviewing the manuscript. All authors read and approved the final manuscript.

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Availability of data and materials

Study materials and de-identified data that support the findings in this study may be obtained with permission from WHO and Ministry of Health and Wellness.

Ethics approval and consent to participate

All ethical formalities for the STEPS survey II were handled by WHO and Ministry of Health and Wellness.

Consent for publication

Not applicable

Competing interests

The authors declare that they do not have conflict of interests.

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