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Health-Promoting Lifestyle Behaviour: A Determinant for Noncommunicable Diseases Risk Factors Among Employees in a Nigerian University

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Abstract

Introduction: Overweight, hyperglycaemia and hypertension are risk factors for development of cardiovascular diseases that have the highest mortality and morbidity rates among noncommunicable diseases (NCDs) globally. The aim of this study was to examine the health-promoting lifestyle behaviour that determine risk factors for Noncommunicable diseases among university employees in Nigeria.

Methods: We conducted a cross-sectional survey among university employees in Nigeria. Data were collected from 280 employees in the university by means of a questionnaire that consisted of three sections. Collected data were analysed using IBM-SPSS version 25.

Results: Good physical activity lifestyle behaviour (adjusted odds ratio [aOR] = 2.1, 95% CI: [1.1–3.9]) and good health responsibility lifestyle behaviour (aOR = 2.4, 95% CI: [1.2–4.9]) were statistically significant predictors of normal body mass index. Also, good health-promoting lifestyle profile (HPLP) (aOR = 3.1, 95% CI: [1.3–7.6]) was a statistically significant predictor of normal waist–hip ratio. However, there is no statistically significant relationship between HPLP and random blood sugar or between HPLP and blood pressure.

Conclusion: The findings from the study reveal that good health-promoting lifestyle behaviour especially health responsibility, physical activity and stress management behaviour are determinant of overweight and obesity which are major risk factors for development of cardiovascular diseases, type II diabetes and some form of cancer. Hence, to reduce the risk of developing noncommunicable diseases, there is a need to develop an intervention to improve university employee's health-promoting lifestyle.

Keywords: health-promoting lifestyle profile, health-promoting lifestyle behaviour, blood pressure, random blood sugar, waist-hip ratio, body mass index, university employees, noncommunicable diseases, Nigeria

1. Introduction

The World Health Organization (WHO) in 1948 described health as a complete state of physical, mental and social well-being and not merely the absence of diseases or infirmity (Huber et al., 2011). Many have challenged this definition in one way or another, but close consideration of the trend in noncommunicable diseases (NCDs) and incidence of sudden death of young and middle-aged adults justifies the WHO definition. Just because someone is not in bed or does not complain of pain or is never absent from the office that cannot be concluded that the individual is healthy. Health is a combination of enhancing physical capabilities together with the existence of social and personal resources. It is a resource for everyday life, not the objective of living (World Health Organization, 2015).

Health-promoting lifestyle profile (HPLP) is widely being use presently to evaluate health-promoting lifestyle behaviour of an individual (Zhang, Wei, Fukumoto, Harada, Ueda, Minamoto, & Ueda, 2011). A health-promoting lifestyle profile involves activities that describe lifestyle or behaviour of an individual. It consists of six subscales and each of the subscale described health-promoting lifestyle behaviour: nutrition, physical activity, health responsibility, stress management, interpersonal relation and self-actualization (Walker, Sechrist, & Pender, 1995; Pirincci, Rahman, Durmuş, & Erdem, 2008; McElligott, Siemers, Thomas, & Kohn, 2009). The current study followed suit in its adaptation for defining health-promoting lifestyle behaviour of university staff. Blood pressure, random blood sugar (RBS), body mass index (BMI) and waist–hip ratio (WHR) of the participants were health status parameters used to determine risk factors to NCDs among employees. These four health parameters are linked to three out four NCDs that cause 81% of the deaths that are related to NCDs (WHO, 2017). Presence of one or more of these risk factors (overweight and obesity, hypertension, hyperglycaemia and dyslipidaemia) creates likelihood of an individual developing cardiovascular diseases (Yang, Liu, Ge, Chen, Zhao, & Yang, 2012).

Maintaining optimal health requires a health-promoting lifestyle. O'Donnell defines health promotion as "an art and science of helping people discover the synergies between their core passions and optimal health, enhancing their motivation to strive for optimal health" (O'Donnell, 2012). Lifestyle-related diseases have been reported as claiming around 70% to 80% of lives in developed counties and 40% to 50% in low and middle-income countries (Pirincci et al., 2008), although the WHO reported recently that deaths associated with NCDs are more frequent in low- and middle-income countries (WHO, 2017). With high mortality and morbidity rates associated with NCDs, all three levels of prevention must be applied in managing them. Since the initial health promotion conference in 1986 there has been a global public health movement on health promotion (Sonmezer, Cetinkaya, & Nacar, 2012). The premise for this movement is that as people engage actively in health-promoting lifestyle practices they enjoy a good quality of life (Sonmezer et al., 2012; Zhang, Tao, Ueda, Wei, & Fang, 2013; Mokdad, 2016).

Health promotion is advocated worldwide as an efficient strategy for enhancing quality of life and controlling the increasing prevalence of NCDs (World Health Organization, 2015). Practicing health-promoting lifestyles involves taking responsibility for health, eating healthy food, avoiding sedentary lifestyle (Sonmezer et al., 2012; Sorour, Kamel, El-Aziz, & Aboelseoud, 2014), avoiding tobacco use, avoiding stress and exhaustion, having seven to eight hours of sleep daily, and maintaining a healthy environment (Sonmezer et al., 2012). High blood pressure, high blood sugar, tobacco use, physical inactivity, and overweight and obesity are the five leading risks for NCDs globally (Al-Qahtani, 2015).

Of all the NCDs, diabetes mellitus, cancers and cardiovascular diseases are the leading cause of deaths globally. Casey et al. (2014), confirmed also in a WHO report that 70% of deaths are caused by NCDs and that 81% of these deaths are from cardiovascular diseases, diabetes mellitus, cancers and respiratory diseases. Also reported is that 81% of these untimely deaths occur in low and middle-income countries (WHO, 2017). NCDs contributed to some 70% of the total burden associated with illness and injury in Australia (Casey et al., 2014). Globally, the total number of people dying from NCDs is double the death rate from a total combination of infectious diseases (Mokdad, 2016). With a rapid increase since 1990 in the rate of NCDs, it has been predicted that by 2030 more than 50% of all deaths and about half of the total burden of diseases will be recorded in low-income countries (Casey et al., 2014; Mokdad, 2016).

In a study conducted among female employees in Egypt, revealed that all the participants who had one of three chronic diseases – diabetes mellitus, hypertension or obesity had poor physical activity, poor health responsibility and poor stress management lifestyle behaviour (Sorour et al., 2014). A study on HPLP and BMI of 796 Taiwanese workers in various occupations revealed that obese workers participated less in the overall health-promoting lifestyle profile and stress management subscale of HPLP compared with workers who had moderate BMI (Huang, Ren-Hau, & Feng-Cheng, 2010). Academic staff in Turkey had highest score on self-actualization and lowest score on physical activity subscales of HPLP and there was a significant difference between HPLP and chronic diseases reported by the workers (Pirincci et al., 2008).

Most risk factors associated with NCDs stem from an unhealthy lifestyle, and adopting health-promoting lifestyle practices will prevent and control the onset of these diseases and complications associated with them (Sorour et al., 2014; WHO, 2017). A healthy lifestyle involves all the efforts an individual makes to promote health and to prevent illness (Sonmezer et al., 2012). Literature revealed an increase in morbidity and mortality rates associated with NCDs (Shehu, Onasanya, Onigbinde, Ogunsakin, & Baba, 2013; Zhang et al., 2013; Casey et al., 2014; Mokdad, 2016). However, health-promoting lifestyle has been identified as a means of preventing the risk and complications associated with the diseases as well as their onset (Fang-Hsin & Hsiu-Hung, 2005; Zhang et al., 2013; Ryu, Park, Choi, & Han, 2014). The reviewed literature indicates that previous studies have been on HPLP or one or more of the health status parameters used to evaluate risk of NCDs. In Nigeria there have been studies on one or more of the health status parameters, but none has dealt with university employees, nor with the relationship between all the four parameters and HPLP. With the statistics on mortality and morbidity rates of NCDs in developing countries (Mokdad, 2016; WHO, 2017), of which Nigeria is one, and on the role of health-promoting lifestyle in relation to risk factors for NCDs (Sonmezer et al., 2012; Zhang et al., 2013; Mokdad, 2016; WHO, 2017), there is evidently a case for examining health-promoting lifestyle practices of university staff in relation to these four health status parameters. This will lead to the development of needed intervention and educational programmes for university employees and workers generally in Nigeria. Findings from this study can also be used for policy formulation. The university employees in this study were staff working in the university setting as either academic staff or non-academic staff.

1.1 Research Question

What is the health-promoting lifestyle behaviour that determine the risk factor for NCDs among university employees in Nigeria?

1.2 Research Purpose

The purpose of the study was to examine health-promoting lifestyle behaviour that determine the risk factors for NCDs among university employees in Nigeria.

2. Material and Methods

The study was a descriptive cross-sectional survey that was conducted among academic and non-academic employees of a university in Nigeria. The university has 70 satellite campuses across the country with 2,657 staff. The university headquarters was purposively selected, and a simple random technique was used to select six states: one from each of the six geopolitical zones in Nigeria. The study participants were drawn from the major satellite campuses (usually one per state) in each of the selected states. All the participants in the selected satellite campuses were selected for the study except those on leave during the survey. Sample size was determined using G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007), which gave a sample size for the study of 231, based on the following parameters: number of groups was 7 (corresponding to selected campuses), with significance level of 0.05 and power of 0.80, using an effect size of 0.25. The calculated sample size of 231 was then increased by 15% to allow for a non-parametric equivalent should the proposed parametric test not be valid. This gave a minimum sample size of 266, and the ultimate sample for the survey was rounded up to 320 to cover for possible attrition.

The 320 total was not divided evenly across the seven campuses because the staff at the various satellite campuses were less numerous than the staff at headquarters. Hence, all the staff at the satellite campuses were selected plus more than 10% (Tay, 2014; Waweru & Omwenga, 2015) of staff from the university headquarter. Data for the survey were collected from 280 participants who were willing and returned the completed questionnaires. Distribution of participants was as follows: campus A, 139; campus B, 19; campus C, 28; campus D, 33; campus E, 24; campus F, 18; campus G, 19. Convenience sampling technique was used to select staff from every department in the headquarter until we had the required number for the study (139).

A questionnaire divided into three sections was used to collect data for the study. The first section recorded personal characteristics: age, study location, sex, religion, designation and marital status. This was followed in the second section by the HPLP we had adapted from the HPLPII originally developed by Walker et al. (1995). It involved nutrition with 20 test items, physical activity with 8 test items, health responsibility with 10 test items, stress management with 10 test items, interpersonal relations with 9 test items and self-actualization scales also with 9 test items. The health-promoting lifestyle of respondents was measured by means of a 4-point Likert scale using ‘never’, ‘sometimes’, ‘often’ and ‘routinely’, which were represented as 1, 2, 3 and 4. The instrument was assessed for face and content validity by experts in nursing in the field of public health and by experts in the medical profession in the field of public health. The Cronbach’s alpha coefficient of the instrument was 0.95 and Cronbach’s alpha coefficient of the subscales of second section varied from 0.78-0.90. The third section consisted of health assessment measures: blood pressure, random blood sugar, height, weight, waist and hip circumference with Cronbach’s alpha coefficient of 0.69.

The pilot study was done in a state university with multiple campuses that replicated the setting for the full study. According to Waweru and Omwenga (2015), the literature suggests that a pilot study sample should be 10% of the sample projected for the large parent study. Hence, convenient sampling method was used to select thirty-two staff members (representing 10% of the study population) from the university headquarter to participate in the pilot study. This study was conducted to appraise the appropriateness and applicability of the research instrument, to estimate the time for data collection and to appraise the feasibility of the study. Ethical approval was obtained from the university’s Human Research Ethics Committee before conducting the pilot study. No modifications were recommended after the study.

Ethical approval for the full study was obtained from the Ethics Committee of the University of KwaZulu-Natal, Durban, South Africa (BFC423/16) and from the National Open University of Nigeria Health Research Ethics Review Committee (NHREC 04). Each participant received an information sheet containing details of the study. They were informed and assured that anonymity and confidentiality would be maintained, and further assured that participation in this study was entirely voluntary, that they were free to withdraw from the study at any time and that data from the study would be used for scientific research purpose only.

In assessing the health-promoting lifestyle behaviour of the respondents, mean rather than sum of subscale items was used to retain the 1 to 4 metric of item responses and to allow meaningful comparisons of scores across the subscales (Walker et al., 1995). The possible range of value was accordingly between 1 and 4. Thus, scores between 1 and 2 (i.e. respondents who reported health-promoting lifestyle subscales as ‘never’ and ‘sometimes’) were understood as reflecting a poor health-promoting lifestyle behaviour. Correspondingly, scores between 3 and 4 (i.e. respondents who reported subscales as ‘often’ and ‘routinely’) were understood as reflecting a good health-promoting lifestyle behaviour. Health assessments were conducted by a registered nurse research assistant after participants had completed the questionnaire. The health assessments were based on blood pressure, random blood sugar, height, weight, and waist and hip circumference. Participants were made to rest in a sitting position for 5 to 10 minutes before taking the blood pressure test. A digital sphygmomanometer was used to measure blood pressure twice, with an interval of 10 minutes, and an average of the two was recorded as the participant’s blood pressure. The blood pressure readings of the respondents were described as normal blood pressure for systolic measuring < 140 and diastolic < 90, and as high blood pressure for systolic ≥ 140 and diastolic ≥ 90 or < 90. Random blood sugar (RBS) was measured using a glucometer and results were in mg/dL. RBS levels of 79-139 (4.4-7.7 mmol/l) and < 79 and ≥140 (<4.4 and >7.7mmol/l) were classified respectively as normal and risk RBS. Height was measured in centimetres accurate to 0.1 cm. Weight was accurate to 0.1kg. BMI was calculated by dividing body weight in kg by the square of the individual’s height in metres. BMI was classified as normal BMI when calculated to be within 18–24.9, and as high BMI when the calculation was ≥ 25.0. Waist circumference was measured at the midpoint between the lower margin of the least palpable rib and the top of the iliac crest, and hip circumference was measured around the widest portion of the buttock, both with a tape measure accurate to 0.1 cm. Waist–hip ratio was calculated by dividing waist circumference by hip circumference. Waist–hip ratio was classified as normal when it was within 0.75–0.85, while 0.86 and above was classified as high waist–hip ratio. Data were analysed using Statistical Package for Social Science (IBM-SPSS version 25). A Cronbach’s alpha analysis was used to determine the reliability of the questionnaire. Descriptive data were analysed using percentage, mean ±standard deviation (SD). Chi-square and Logistic regression were performed to establish the association between HPLP and health status of university staff. Statistical significance was set at a p-value of 0.05.

3. Results

3.1 Description of the Population

The response rate was 87.5%. One hundred and twenty-six (45.0%) of the respondents were within the age range of 30-39 years with mean age of 40.13 ± 9.53 years. Majority (55.7%) were male and more than three-quarters (87%) were Christian and 73.9% were married. In level of education, 73.9% had tertiary education, and 49.3% earned low income (less than N100,000) monthly.

Most respondents (86.8%) had normal RBS, but 13.2% had risk (combination of low and high) RBS, with a mean of 98.65 ± 21.30mg/dl, minimum 69 and maximum 222. Tables 1 to 4 summarises HPLP and health status of the university staff.

Table 1 below shows that 24.3% and 27.1% of university staff with high blood pressure had poor physical activity and poor health responsibility lifestyle. Interpersonal relation and total HPLP had statistically significant association with blood pressure at $p < 0.05$.

Table 1. Health-promoting lifestyle behaviour and blood pressure of university staff

HPLP subscale	Blood pressure		
	Normal %	**High %**	***p*-value**
Good nutrition	53.9	24.6	**P > 0.05**
Poor nutrition	12.1	9.3	
Good physical activity	18.6	9.6	**P > 0.05**
Poor physical activity	47.5	24.3	
Good health responsibility	19.3	6.8	**P > 0.05**
Poor health responsibility	46.8	27.1	
Good stress management	42.5	21.8	**P > 0.05**
Poor stress management	23.6	12.1	
Good interpersonal relation	53.6	23.2	**P < 0.05**
Poor interpersonal relation	12.5	10.7	
Good self-actualization	60.4	30.4	**P > 0.05**
Poor self-actualization	5.7	3.6	
Good total health-promoting lifestyle profile	50.7	22.1	**P < 0.05**
Poor total health-promoting lifestyle profile	15.4	11.8	

Table 2 reveals that 7.1% and 6.1 % of university staff with poor physical activity and poor health responsibility lifestyle respectively had risk random blood sugar values. There is no statistically significant association between health-promoting lifestyle behaviour and random blood sugar of the participants.

Table 2. Health-promoting lifestyle behaviour and random blood sugar of university staff

HPLP subscale	Random blood sugar (RBS)		
	Normal %	**Risk %**	***p*-value**
Good nutrition	71.8	6.8	**P > 0.05**
Poor nutrition	18.9	2.5	
Good physical activity	26.1	2.1	**P > 0.05**
Poor physical activity	64.6	7.1	
Good health responsibility	22.9	3.2	**P > 0.05**
Poor health responsibility	67.9	6.1	
Good stress management	57.9	6.4	**P > 0.05**
Poor stress management	32.9	2.9	
Good interpersonal relation	68.6	8.2	**P > 0.05**
Poor interpersonal relation	22.1	1.1	
Good self-actualization	78.2	12.5	**P > 0.05**
Poor self-actualization	8.6	0.7	
Good total health-promoting lifestyle profile	66.1	6.8	**P > 0.05**
Poor total health-promoting lifestyle profile	24.6	2.5	

Table 3 shows that more than 50% of participants with poor physical activity and poor health responsibility lifestyle had high BMI. one-quarter (25.1%) of participants with poor stress management lifestyle had high BMI. BMI showed statistically significant association with nutritional lifestyle, physical activity lifestyle and health responsibility lifestyle subscales at p<0.05 respectively.

Table 3. Health-promoting lifestyle behaviour and body mass index of university staff

HPLP subscale	**Body mass index (BMI)**		
	Normal %	**High %**	***p*-value**
Good nutrition	19.3	59.3	**P < 0.05**
Poor nutrition	8.2	13.2	
Good physical activity	10.4	17.9	**P < 0.05**
Poor physical activity	17.1	54.6	
Good health responsibility	4.6	21.4	**P < 0.05**
Poor health responsibility	22.9	51.1	
Good stress management	17.1	47.1	**P > 0.05**
Poor stress management	10.4	25.4	
Good interpersonal relation	20.7	56.1	**P > 0.05**
Poor interpersonal relation	6.8	16.4	
Good self-actualization	23.6	67.1	**P > 0.05**
Poor self-actualization	3.9	5.4	
Good total health-promoting lifestyle profile	18.9	53.9	**P > 0.05**
Poor total health-promoting lifestyle profile	8.6	18.6	

Table 4 reveals no statistical association between health-promoting lifestyle behaviour and waist-hip ratio at p<0.05.

Table 4. Health-promoting lifestyle behaviour and waist-hip ratio (WHR) of university staff

HPLP subscale	**Waist–Hip Ratio (WHR)**		
	Normal %	**High %**	***p*-value**
Good nutrition	25.4	53.2	**P > 0.05**
Poor nutrition	6.8	14.6	
Good physical activity	7.1	21.1	**P > 0.05**
Poor physical activity	25.0	46.8	
Good health responsibility	7.5	18.6	**P > 0.05**
Poor health responsibility	24.6	49.3	
Good stress management	18.9	45.4	**P > 0.05**
Poor stress management	13.2	22.5	
Good interpersonal relation	24.3	52.5	**P > 0.05**
Poor interpersonal relation	7.9	15.4	
Good self-actualization	28.9	61.8	**P > 0.05**
Poor self-actualization	3.2	6.1	
Good total health-promoting lifestyle profile	24.4	48.2	**P > 0.05**
Poor total health-promoting lifestyle profile	7.5	19.6	

We also conducted multiple logistic regression to examine the influence of health-promoting lifestyle profile on health status parameters that are risk factors to NCDs. The health status parameters were the dependent variables: body mass index, blood pressure, random blood sugar, and waist–hip ratio. Four models were built to examine the influence of HPL which were nutrition, physical activity, health responsibility, stress management, interpersonal relations, self-actualization and total HPLP on health status parameters. Adjusted odds ratios and 95% confidence intervals were estimated for each subscale. The confounding variables for each of the model built were nutrition, physical activity, health responsibility, stress management, interpersonal relations, self-actualization and total HPLP.

Table 5. Multiple logistic regression for HPLP and associated health status parameters of university staff

Explanatory variables	**Categories of explanatory variables**	**B**	**SE**	***p*-value**	**Adjusted odds ratio**	**Confidence interval**
			Model 1 – Blood pressure			
Nutritional lifestyle subscale	Good Poor	0.303	0.352	0.390	1.353 1	0.671–2.697
Physical activity lifestyle subscale	Good Poor	0.213	0.301	0.480	1.237 1	0.686–2.232
HR lifestyle subscale	Good Poor	-0.368	0.322	0.253	0.692 1	0.368–1.300
Stress management lifestyle subscale	Good Poor	0.347	0.319	0.277	1.415 1	0.757–2.647
IR lifestyle subscale	Good Poor	0.524	0.357	0.142	1.688 1	0.839–3.397
Self-actualization lifestyle subscale	Good Poor	0.078	0.71	0.869	1.081 1	0.429–2.722
THPLP	Good Poor	-0.312	0.424	0.462	0.732 1	0.319–1.680
			Model 2 – Random Blood Sugar			
Nutritional lifestyle subscale	Good Poor	-0.608	0.489	0.214	0.545 1	0.209-1.419
Physical activity lifestyle subscale	Good Poor	-0.288	0.427	0.501	0.750 1	0.325-1.732
HR lifestyle subscale	Good Poor	0.547	0.402	0.174	1.727 1	0.785-3.799
Stress management lifestyle subscale	Good Poor	-0.611	0.406	0.132	0.543 1	0.245-1.203
IR lifestyle subscale	Good Poor	-0.155	0.530	0.770	0.857 1	0.303-2.421
Self-actualization lifestyle subscale	Good Poor	0.753	0.816 1	0.356	2.124 1	0.429-10.501
THPLP	Good Poor	0.646	0.624 1	0.300	1.909 1	0.562-6488

Model 3 – Body Mass Index						
Nutritional lifestyle subscale	Good Poor	0.702	0.372	0.060	2.017 1	0.972–4.185
Physical activity lifestyle subscale	Good Poor	0.741	0.314	0.018	2.097 1	1.133–3.884
HR lifestyle subscale	Good Poor	0.877	0.367	0.017	2.403 1	1.170–4.936
Stress management lifestyle subscale	Good Poor	-0.087	0.341	0.798	0.916 1	0.470–1.787
IR lifestyle subscale	Good Poor	-0.199	0.399	0.618	0.820 1	0.375–1.792
Self-actualization lifestyle subscale	Good Poor	0.761	0.477	0.110	2.140 1	0.841–5.447
THPLP	Good Poor	-0.065	0.467	0.890	0.937 1	0.375–2.344
Model 4 – Waist–Hip Ratio						
Nutritional lifestyle subscale	Good Poor	0.251	0.372	0.499	1.286 1	0.620–2.664
Physical activity lifestyle subscale	Good Poor	0.545	0.315	0.083	1.724 1	0.931–3.194
HR lifestyle subscale	Good Poor	0.276	0.317	0.383	1.318 1	0.708–2.453
Stress management lifestyle subscale	Good Poor	0.585	0.312	0.061	1.795 1	0.974–3.307
IR lifestyle subscale	Good Poor	0.295	0.378	0.436	1.343 1	0.640–2.817
Self-actualization lifestyle subscale	Good Poor	0.231	0.487	0.635	1.260 1	0.485–3.271
THPLP	Good Poor	1.135	0.457	0.013	3.110 1	1.270–7.616

Note. HR - Health responsibility, IR- Interpersonal relation, THPLP- Total health-promoting lifestyle profile, B- Beta (estimate), SE – Standard error.

As indicated in Table 5, the model for HPLP and blood pressure showed no statistically significant relationship. However, respondents were more likely to have normal blood pressure if they had good lifestyle behavioural subscales for the following: nutritional (adjusted odds ratio [aOR] = 1.4, 95%CI: [0.7–2.7]); physical activity (aOR = 1.2, 95% CI: [0.7–2.2]); stress management (aOR = 1.4, 95% CI: [0.8–2.6]); interpersonal relation (aOR = 1.7, 95% CI: [0.8–3.4]) and self-actualization (aOR = 1.1, 95% CI: [0.4–2.7]). Likewise, the model for HPLP and RBS showed no statistically significant relationship. However, respondents were more likely to have normal RBS if they had good lifestyle behavioural subscales for the following: health responsibility (aOR = 1.7, 95% CI: [0.7–4.3]); good self-actualization (aOR = 2.1, 95% CI: [0.4–10.5]); good total health-prompting lifestyle (aOR = 1.9, 95% CI: [0.6–6.5]).

The model for HPLP and BMI showed that good physical activity lifestyle behaviour (aOR = 2.1, 95% CI: [1.1–3.9]) and good health responsibility lifestyle behaviour (aOR = 2.4, 95% CI: [1.2–4.9]) were significant predictors of normal BMI. Furthermore, the model for HPLP and waist–hip ratio showed that good total HPLP (aOR = 3.1, 95% CI: [1.3–7.6]) was a statistically significant predictor of normal WHR. Similarly, respondents with good lifestyle behavioural on each of the HPLP subscales were more likely to have normal WHR although these were not statically significant predictors of normal WHR.

4. Discussion

The quest for health and well-being, together with the high cost of managing NCDs, has drawn increased attention to the need for health-promoting lifestyle practices (Abu-Moghli, Khalaf, & Barghoti, 2010; Zhang et al., 2013; Mokdad, 2016). Overweight, obesity, hypertension, dyslipidaemia, and hyperglycaemia are linked to lifestyle practices (Yang et al., 2012). It was established that there is a relationship between a health-promoting lifestyle and health status (Abu-Moghli et al., 2010). Health-promoting lifestyle practice is key in the control and prevention of NCDs and of mortality and morbidity associated with this 'monster' (Fang-Hsin & Hsiu-Hung, 2005; Sorour et al., 2014). With limited literature on relationship between health-promoting lifestyle behaviour and risk factors related to NCDs among university employees, this study add to the existing literature on health-promoting lifestyle behaviour and NCDs risk factors among university employees.

Our study revealed that about three-quarters of the university staff had high BMI and WHR, and that more than one-quarter and one-tenth respectively had high blood pressure and high random blood sugar. These four parameters are among the five leading global risk for NCDs (Al-Qahtani, 2015) and also, evaluate the risk of cardiovascular diseases (World Health Organisation [WHO], 2011). There is likelihood of developing or diagnosing with cardiovascular disease if an individual suffers from one or more of the following: physical inactivity, overweight, hypertension, aging, dyslipidaemia and hyperglycaemia (Yang et al., 2012). In our study the majority of our respondents scored low on the physical activity, health responsibility and stress management lifestyle behaviour. Similar findings were reported among female employees in Zagazig city, where 20% of the employees were hypertensive, 26% were diabetic and 68.5% were obese. Furthermore, they had poor scores on the physical activity, stress management and health responsibility subscales (Sorour et al., 2014).

Most of our respondents were in the age range 30–69. The WHO reports that of the 15 million people globally that die from NCDs each year, 80% are in this age range and also that three-quarters of total global deaths related to NCDs occur in low- and middle-income countries (WHO, 2017). The main types of NCDs are cardiovascular diseases (like heart attacks and stroke), diabetes mellitus, cancers and chronic respiratory diseases like asthma (Mokdad, 2016; WHO, 2017). Among our respondents, only 10.7% declared that they were hypertensive, 2.1% that they were diabetic and 4.3% that they were asthmatic, which differs from the health assessments findings. It is possible that the rest of the respondents found to have high blood pressure and high RBS had not been aware of their health status prior to the survey.

Findings from the study showed that nutrition, physical activity and health responsibility behaviours had statistically significant association with BMI. Furthermore, interpersonal relation subscale and total HPLP had a statistically significant association with blood pressure. Findings similar to ours were reported in a study conducted among academic staff in Turkey in which highest scoring subscale was self-actualization and lowest was physical activity, and in which HPLP had statistically significant relationship with chronic diseases reported by workers (Pirincci et al., 2008). Another previous study reported that women who were obese, hypertensive and diabetic had poor health responsibility, physical activity and stress management (Sorour et al., 2014). Similarly, a study conducted among Taiwanese workers revealed that obese workers participated less in total HPLP and in stress management (Huang et al., 2010).

Logistic regression analysis showed that poor nutrition; physical activity; stress management; interpersonal relation and self-actualization lifestyle behaviour were more likely to be the determinant of risk factors for high blood pressure. Similarly, poor health responsibility; self-actualization; total health-promoting lifestyle behaviour were more likely to be the determinant of risk factors for high random blood sugar. Although, the model was not significant. However, the model for HPLP and BMI showed that poor physical activity and health responsibility lifestyle behaviour were determinant of risk factors for BMI. Furthermore, the model for HPLP and waist–hip ratio showed that HPLP was determinant of risk factors for WHR. Sorour et al. (2014), reported similar findings in a study conducted among female employees in Egypt, where all the participants who had one of three chronic diseases – diabetes mellitus, hypertension or obesity had poor physical activity, poor health responsibility and poor stress management lifestyle behaviour.

Possible reasons for the model of blood pressure and random blood sugar results not statistically significant may be the age group of the study population as majority of our respondents were between age 30–39 years. Yoon, Fryar and Carroll (2015) reported that the prevalence rate of hypertension among adults in United State of America increases with age, from 7.3% among adults aged 18–39 to 32.2% among those aged 40–59, and 64.9% among those aged 60 and over. Furthermore, due to work overload which cumulated into poor stress management, many of the respondent reported for the RBS test more than four hours after eating. This may be the cause why majority have normal RBS value which might have also influence the outcome of the study.

BMI and WHR are risk factors to development of cardiovascular diseases, type II diabetes and some cancers (World Health Organisation, 2017). A healthy lifestyle is key to preventing the development of chronic diseases, reducing morbidity, reducing medical costs and the associated burden, and improving the quality of life of an individual (Zhang et al., 2013). There is need to introduce ways of encouraging university staff to assume health responsibility and improve their physical activity.

Our findings also emphasise the need for improvement in physical activity and health responsibility in the health-promoting lifestyles of university staff. One possible reason for low scores by university staff in the physical activity and health responsibility subscales could be heavy workload. This possibility is supported by the findings of Shehu and Onasanya, who reported that 93.5% of staff and students at a federal university in Nigeria did not participate in health promotion initiatives of the university due to the enormous academic workload (Shehu et al., 2013). It is essential to increase awareness of workers and people generally on the important of these two subscales behaviours (physical activity and health responsibility) and corresponding re-orientation of university staff. stress management, good nutrition, interpersonal relations and self-actualizing health-promoting lifestyle are nonetheless also important overall in achieving career success and enjoying a good quality of life.

some of our results were not statistically significant, but they are clinically significant in the prevention and control of NCDs. Blood pressure is the principal determinant of cardiovascular diseases which have high mortality rate among NCDs (World Health Organisation, 2017) and it was found to be statistically significant associate with total HPLP. Detection through screening and treatment along with palliative care are important components of a response to NCDs (Yang et al., 2012; WHO, 2017) and the figures that emerge further substantiate the need for health-promoting lifestyle practices in prevention and control of NCDs. Health responsibility, physical activity and stress management subscale behaviours in health-promoting lifestyle profile were found to be least practiced in this current study. Literature reported similar findings among different populations (Pirincci et al., 2008; McElligott et al., 2009; Huang et al., 2010; Sonmezer et al., 2012; Zhang et al., 2013; Al-Qahtani, 2015); this might be why NCDs statistics are high in low- and middle-income countries (WHO, 2017). It is therefore important to develop a model for university staff to improve total health-promoting lifestyle profile, especially physical activity, stress management and health responsibility.

5. Conclusion

The aim of this study was to examine the health-promoting lifestyle behaviour that determine risk factors for Noncommunicable diseases among university employees in Nigeria. Risk factors for Noncommunicable diseases were assessed by four health status parameters (blood pressure, random blood sugar, body mass index and waist-hip-ratio) that are implicated in the control and prevention of noncommunicable diseases (NCDs). The study showed that there was a significant association between some subscales of the health-promoting lifestyle profile and the health status of university employees in Nigeria. However, employees with good HPLP were likely to have good health status. The fact remains that health is wealth, and there are many things a person who is healthy can achieve compared with someone who may be wealthy but battles to cope with an ailment. Healthy lifestyle reduces both mortality and morbidity associated with diseases. The findings from this study thus provide useful information to guide health professionals in designing interventions for promotion of a healthy lifestyle among Nigerians. Organizations that encourage their staff to participate in health-promoting lifestyle practices are indirectly improving their productivity while also improving the living standard of the staff. Hence, policy makers in Nigeria should consider the findings from this study as useful input for prevention of NCDs.

Limitations of this study mainly relate to sample selection technique for the university headquarters and screening for diabetes mellitus. Tight workload schedules made staff at headquarters reluctant to participate in the study and we therefore used convenience sampling method to select respondents. We had intended to conduct random blood sugar tests screening, estimated blood sugar levels 2 hours after feeding for diabetes mellitus, but individuals in the survey sample could only make themselves available on average of 5 to 7 hours after their last meal. This might have influenced the RBS results.

Because the regression models in the study showed no significant relationship between health-promoting lifestyle profile and random blood sugar and blood pressure, further research will therefore be needed to clarify these points. Although, majority (55.7%) of our participants that willingly participated in the study were within the age range of 20-39 years which might have also influence the outcome of these study. Low HPLP scores in physical activity, health responsibility and stress management subscales indicate that ways should be found to encourage university staff to assume health responsibility and improve physical activity. In this study, the setting was an open- and distance-learning university with multiple satellite campuses; further research is therefore needed on staff HPLP in conventional universities. There is a need to repeat this type of study with a larger sample size as some of the results in this current study were not statistically significant. Lastly, further research is necessary to understand the influence of the health-promoting lifestyle profile on random blood sugar and fasting blood sugar.

Authors' Contribution

Conceptualization, design of methodology: EMJ, BPN, OOI

Data curation and original draft preparation: EMJ

Funding acquisition: EMJ, BPN

Supervision, review and editing: BPN, OOI

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Competing Interests Statement

The authors declare that they have no competing interests.

References

Abu-Moghli, F. A., Khalaf, I. A., & Barghoti, F. F. (2010). The influence of a health education programme on healthy lifestyles and practices among university students. *International journal of nursing practice, 16*(1), 35-42. https://doi.org/10.1111/j.1440-172X.2009.01801.x

Al-Qahtani, M. F. (2015). Health-promoting lifestyle behaviors among nurses in private hospitals in Al-Khobar, Saudi Arabia. *Journal of the Egyptian Public Health Association, 90*(1), 29-34. https://doi.org/10.1097/01.EPX.0000461325.97703.8a

Casey, L. M., Clough, B. A., Mihuta, M. E., Green, H., Usher, W., James, D. A., . . . Laakso, E. (2014). Computer-based interactive health communications for people with chronic disease. *Dovepress Journal: Smart Homecare Technology and TeleHealth, 2*, 29-38. https://doi.org/10.2147/SHTT.S42684

Fang-Hsin, L. & Hsiu-Hung, W. (2005). A preliminary study of a health-promoting lifestyle among Southeast Asian women in Taiwan. *The Kaohsiung journal of medical sciences, 21*(3), 114-120. https://doi.org/10.1016/S1607-551X(09)70287-6

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior research methods, 39*(2), 175-191. https://doi.org/10.3758/BF03193146

Huang, S.-L., Ren-Hau, L., & Feng-Cheng, T. (2010). Comparing disparities in the health-promoting lifestyles of Taiwanese workers in various occupations. *Industrial health, 48*(3), 256-264. https://doi.org/10.2486/indhealth.48.256

Huber, M., Knottnerus, J. A., Green, L., van der Horst, H., Jadad, A. R., Kromhout, D., . . . van der Meer, J. W. (2011). How should we define health? *BMJ: British Medical Journal, 343*. https://doi.org/10.1136/bmj.d4163

McElligott, D., Siemers, S., Thomas, L., & Kohn, N. (2009). Health promotion in nurses: Is there a healthy nurse in the house? *Applied Nursing Research, 22*(3), 211-215. https://doi.org/10.1016/j.apnr.2007.07.005

Mokdad, A. H. (2016). Global non-communicable disease prevention: Building on success by addressing an emerging health need in developing countries. *Journal of Health Specialties, 4*(2), 92. https://doi.org/10.4103/1658-600X.179820

O'Donnell, M. P. (2012). Erosion of Our Moral Compass, Social Trust, and the Fiscal Strength of the United States: Income Inequality, Tax Policy, and Well-Being. *American Journal of Health Promotion, 26*(4), iv-xi. https://doi.org/10.4278/ajhp.26.4.iv

Pirincci, E., Rahman, S., Durmuş, A., & Erdem, R. (2008). Factors affecting health-promoting behaviours in academic staff. *Public health, 122*(11), 1261-1263. https://doi.org/10.1016/j.puhe.2008.04.006

Ryu, S. Y., Park, J., Choi, S. W. & Han, M. A. (2014). Associations between socio-demographic characteristics and healthy lifestyles in Korean Adults: the result of the 2010 Community Health Survey. *Journal of Preventive Medicine and Public Health, 47*(2), 113-123. https://doi.org/10.3961/jpmph.2014.47.2.113

Shehu, R., Onasanya, S., Onigbinde, T., Ogunsakin, E., & Baba, D. (2013). Lifestyle, Fitness and Health Promotion Initiative of the University of Ilorin, Nigeria: An Educational Media Intervention. *Ethiopian Journal of Environmental Studies and Management, 6*(3), 273-279. https://doi.org/10.4314/ejesm.v6i3.7

Sonmezer, H., Cetinkaya, F., & Nacar, M. (2012). Healthy life-style promoting behaviour in Turkish women aged 18-64. *Asian Pac J Cancer Prev, 13*(4), 1241-1245. https://doi.org/10.7314/APJCP.2012.13.4.1241

Sorour, A. S., Kamel, W. W., El-Aziz, E. M. A., & Aboelseoud, A. (2014). Health promoting lifestyle behaviors and related risk factors among female employees in Zagazig city. *Journal of Nursing Education and Practice, 4*(5), 42-51. https://doi.org/10.5430/jnep.v4n5p42

Tay, I. (2014). To what extent should data saturation be used as a quality criterion in qualitative research. Retrieved from https://www.linkedin.com/pulse/20140824092647-82509310-to-what-extent-should-data-saturation-be-used-as-a-quality-criterion-in-qualitative-research

Walker, S. N., Sechrist, K. R., & Pender, N. J. (1995). Health Promotion Model - Instruments to Measure Health Promoting Lifestyle: HealthPromoting Lifestyle Profile [HPLP II] (Adult Version). *American journal of preventive medicine.* Retrieved from https://deepblue.lib.umich.edu/handle/2027.42/85349

Waweru, P., & Omwenga, J. (2015). The Influence of Strategic Management Practices on Performance of Private Construction Firms in Kenya *International Journal of Scientific and Research Publications, 5*(6).

WHO. (2017). *Noncommunicable diseases*. Retrieved from http://www.who.int/mediacentre/factsheets/fs355/en/

World Health Organisation. (2011). *Waist Circumference and Waist–Hip Ratio: Report of a WHO Expert Consultation Geneva, 8–11 December 2008*. Retrieved from http://apps.who.int/iris/bitstream/10665/44583/1/9789241501491_eng.pdf. May 2017.

World Health Organisation. (2017). Noncommunicable diseases. Retrieved from http://www.who.int/mediacentre/factsheets/fs355/en/

World Health Organization. (2015). *The Ottawa Charter for Health Promotion*. Retrieved November, 2015, from http://www.who.int/healthpromotion/conferences/previous/ottawa/en/

Yang, Z.-J., Liu, J., Ge, J.-P., Chen, L., Zhao, Z.-G., & Yang, W.-Y. (2012). Prevalence of cardiovascular disease risk factor in the Chinese population: the 2007–2008 China National Diabetes and Metabolic Disorders Study. *European heart journal, 33*(2), 213-220. https://doi.org/10.1093/eurheartj/ehr205

Yoon, S. S., Fryar, C. D., & Carroll, M. D. (2015). *Hypertension prevalence and control among adults: United States, 2011-2014*. US Department of Health and Human Services.

Zhang, S.-C., Tao, F.-b., Ueda, A., Wei, C.-N., & Fang, J. (2013). The influence of health-promoting lifestyles on the quality of life of retired workers in a medium-sized city of Northeastern China. *Environmental health and preventive medicine, 18*(6), 458-465. https://doi.org/10.1007/s12199-013-0342-x

Zhang, S., Wei, C., Fukumoto, K., Harada, K., Ueda, K., Minamoto, K., & Ueda, A. (2011). A comparative study of health-promoting lifestyles in agricultural and non-agricultural workers in Japan. *Environmental health and preventive medicine, 16*(2), 80-89. https://doi.org/10.1007/s12199-010-0167-9

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