

Determinants of Uptake of Periodic Medical Examination among Students of College of Health Sciences, Obafemi Awolowo University Ile-Ife, South-West Nigeria

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Abstract

Background: This research was conducted to assess the factors that determine the uptake of periodic medical examination (PME) among undergraduate students in Ile-Ife, Nigeria. **Methods:** A sample size of 328 was calculated using the sample size formula for a single proportion. Hence, a total of 328 undergraduate students of the College of Health Sciences at the Obafemi Awolowo University, Ile-Ife, were included in this descriptive, cross-sectional study. A multistage sampling technique was adopted and the sampling was proportional to the size of the four undergraduate academic programs in the college. Data were collected using a self-administered questionnaire. Chi-square and *t*-tests were used to assess significant factors associated with its uptake. The determinants of PME uptake were identified using binary logistic regression. **Results:** The majority of the respondents, 299 (91.2%), were aware of PME. The uptake was however poor, 93 (28.4%). The most common barrier to the uptake was “inadequate time” due to the students’ perceived busy schedule. Others were religion, years spent in school, perceived susceptibility to diseases, cost of service, fear of the results, and lack of interest. The odd of uptake of PME was 18.3 times higher among people that express willingness relative to the participants without intention to uptake PME, $P < 0.001$. **Conclusion:** The uptake of PME was poor despite the high level of awareness probably due to the perceived low disease susceptibility among the students and poor access to PME services. There is, therefore, a need for creating an enabling environment through policy formulation by the university’s management to address the barriers against the uptake of PME. Sensitization on the risk factors of chronic non-communicable diseases is also necessary to address the poor perception of susceptibility.

Keywords: Determinants, Ile-Ife, periodic medical examination, Southwest Nigeria, undergraduates

INTRODUCTION

Periodic medical examination (PME) is one of the key measures toward promoting the health of the population. It is a channel through which individuals receive recommended health screening and interventions which assist them to remain in a state of fitness throughout life.^[1] In the context of undergraduate students, it is a channel for the provision of age and occupation-specific recommended screening and intervention services that promote their health and enhance their optimal academic performances.

PMEs are intentional periodic or regular scrutiny or investigations conducted on apparently healthy persons to

identify early any deviation from health at the primary level of care.^[1] It may entail history taking, physical examination, and laboratory tests, tailored to individual needs.^[1,2] A proposed startup age for undergoing PME is 19 or 20 years old and to

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be observed every 3–5 years for females and every five years for males.^[3,4] PME is different from pre-employment or preadmission medical screening tests which are one-off events. This medical scrutiny is a primary preventive health measure for the early diagnosis of diseases and prevention of undue morbidity and mortality.^[2]

Grievous unforeseen occurrences leading to morbidity or death have been reported among undergraduate students.^[5] Chronic non-communicable diseases such as hypertension have been reported among undergraduate students in Angola.^[6] More devastating are the many instances of sudden deaths reported among undergraduate students across many Nigerian universities,^[5] with a few being exercise-related.^[7] These deaths may have been prevented if the underlying causes or pathologies responsible for them have been identified through a culture of undergoing a PME.

There have been studies assessing the knowledge and practice of PME or checkups among various population groups such as residents in communities^[8,9] or hospital staff.^[2] However, there is a paucity of studies assessing PME uptake among undergraduates to the best of our knowledge. A few studies assessed their level of awareness, knowledge, and practice of PME,^[10] while another conducted a literature review on the causes of sudden death among them.^[7,11] What determines the uptake of PMEs among them were not assessed.

Majority of the studies conducted to assess the uptake of PME among different groups showed poor uptake of the service.^[9,12,13] A similar study conducted among Ghanaians, however, had a high proportion of respondents (68.1%) who had undergone PME.^[14] The study conducted among medical and nonmedical undergraduate students showed that 54% of those who knew the significance of PMEs (63%) practised it. They found that medical students were more knowledgeable about it than the nonmedical students.^[10] A common factor associated with the poor uptake or willingness to uptake PME was the fear of being diagnosed of having diseases that were unknown before the examination.^[8,15,16] Poor communication and paucity of advice on periodic medical screening from health-care workers were also identified as barriers to the uptake of PME.^[8,16] Time factor was also identified as a barrier in few studies; majority perceived the time to complete the process of physical examination and the waiting time to obtain the results of PME as a barrier.^[15,16]

Undergraduate students comprise mainly adolescents and young adults due to the structure of the Nigerian education system. This age range represents a significant proportion of the population with an optimal state of health.^[17,18] This also coincides with the age range characterized by the onset of exposure to risk factors that may culminate in the development of chronic non-communicable diseases. PME is a veritable preventive measure against chronic non-communicable diseases and their associated risk factors. The aim of this study is, therefore, to assess the determinants of PME uptake among undergraduate students in Ile-Ife.

METHODS

This study was conducted at the Obafemi Awolowo University, Ile-Ife, South-West Nigeria. The university is one of the leading public universities in Nigeria with a student population of about 35,000 and a staff strength of >5000.^[19] The school provides limited accommodation for students and staff on campus, while majority dwell off-campus. There is however a special consideration for people with disabilities in terms of allocation of accommodation on campus.

The university's health center provides preventive and primary care for the students, staff, and other workers on campus. The health center conducts compulsory preadmission medical screening and pre-employment medical screening for students and staff, respectively. There is however no known policy or program on periodic medical screening. The health center also provides inpatient and outpatient services, excluding surgical services. The surgical cases and other cases that require specialist care are referred to the affiliated tertiary health facility. Most medical and laboratory services provided at the center are covered by insurance for the students and staff of the institution.

Study design and study population

This was a descriptive, cross-sectional study among undergraduate students of the College of Health Sciences in their third to sixth academic year.

Sample size and sampling technique

A sample size of 328 was calculated using the sample size formula for a single proportion.^[20] The students of the College of Health Sciences of the institution were studied. The college comprises three faculties, namely clinical science, dentistry, and basic medical sciences, and four programs where students have direct contact with patient care during their undergraduate training were purposely selected: medicine, dentistry, nursing, and medical rehabilitation. All these faculties were visited. Proportionate sampling to size was used to determine the number of students to be interviewed per program and per level of the study. This was done by determining the number of students per program/level, then divided by the total number across the programs/level, and multiplied by the sample size. Individuals were then enrolled in different levels of study using a systematic random sampling technique based on the attendance register at tutorial sessions until the desired number for the level of study per program was achieved.

Data collection

Data were collected using a self-administered pretested questionnaire. The questionnaire comprises five sections: Section A contains sociodemographic variables, while section B contains questions on the awareness of PME. Section C contains questions that assess the attitude of students towards PME. The assessment of attitude was based on a 5-point Likert scale where 1 represents “strongly disagree” and 5 represents “strongly agree.” Section D assessed the uptake of PME and Section E assessed the perception of students about PME. This includes perceived barriers, relevance, and susceptibility to

diseases commonly screened for during PME. The perceived relevance and susceptibility were based on a 3-point Likert scale where 1 represents “not relevant” or “not likely,” while 3 represents “relevant” or “likely” respectively.

Data analysis

Data were analyzed using IBM SPSS Statistics version 20.0 software (IBM Corp., Armonk, NY, USA). Categorical variables such as sociodemographic variables, level of awareness, and perception of PME were summarized using frequencies and proportions. Continuous variables such as age were summarized using mean and standard deviation. Multiple response analysis was used to assess awareness of the components of PME, perceived relevance of PME, and barriers toward the uptake of PME. Attitude of the respondents toward PME was analyzed through the summation of responses to questions in Section C of the questionnaire. Students were classified into poor, fair, and good based on their score relative to the maximum attainable score. Perception of susceptibility to chronic non-communicable diseases or sudden death was also scored by the summation of responses to questions in Section E of the questionnaire to assess perception about PME. Students that scored the median of the maximum attainable score and above were classified as having good perception, while those that scored below the median value were classified as having poor perception. Association between the uptake of PME and respondents' characteristics such as sociodemographic variables, perceived susceptibility and barriers, and intention to uptake PME was assessed using Chi-square test. Determinants of PME uptake were assessed using binary logistic regression. $P < 0.05$ was considered to be statistically significant.

Ethical considerations and approval

Ethical approval was obtained from the Research and Ethics Committee of the Institute of Public Health, Obafemi Awolowo University, Ile-Ife, Nigeria. Verbal consent was sought from each respondent after an adequate explanation of the objectives of the study. Confidentiality and data security were assured. Participation was made voluntary as each participant was at liberty to opt-out at any point in the study.

RESULTS

A total of 328 undergraduate students were involved in the study. An almost equal proportion of males and females were enrolled, 51.8% and 48.2%, respectively. The majority were single, 310 (94.5%), while others were married. Majority of the students were Christians, 286 (87.2%) followed by Muslims, 41 (12.5%). Students in their fourth year in the university accounted for 44.5% of the respondents, followed by respondents in their 5th year of study (23.5%). Students in the third and sixth years constituted 14.3% and 17.7% of the respondents, respectively. Details are as shown in Table 1.

Awareness of periodic medical screening was high among the respondents, 299 (91.2%) as shown in Figure 1. The most commonly mentioned component of periodic medical screening was a blood pressure check, 315 (96.6%). This was followed

Table 1: Sociodemographic characteristics of respondents

Variables	Frequency (%), (n=328)
Age (years)	
15-19	6 (1.8)
20-24	247 (75.3)
25-40	75 (22.9)
Age (mean±SD)	23.3±2.7
Sex	
Female	158 (48.2)
Male	170 (51.8)
Marital status	
Single	310 (94.5)
Married	18 (5.5)
Religion	
Christianity	286 (87.2)
Islam	41 (12.5)
Traditional	1 (0.3)
Ethnicity	
Yoruba	286 (87.2)
Igbo	22 (6.7)
Hausa	2 (0.6)
Others	18 (5.5)
Department	
Medicine	157 (47.9)
Dentistry	39 (11.9)
Nursing	91 (27.7)
Medical rehabilitation	41 (12.5)
Level	
300	47 (14.3)
400	146 (44.5)
500	77 (23.5)
600	58 (17.7)

by the proportion of respondents that mentioned HIV screening test, 311 (95.4%). The other most mentioned screenings were dental check, 309 (94.8%), blood glucose check, 301 (92.3%), and clinical breast examination, 298 (91.4%). Audiometry test and stool test for occult malignancy were the least mentioned tests meant for periodic medical screening, 196 (60.1%) and 202 (62.0%), respectively. Details are as shown in Table 2.

The uptake of PME was low among the respondents. Less than one-third of the respondents, 93 (28.4%), had ever undergone PME, as shown in Figure 2. More than half of the students, 174 (53.0%), had at least one perceived barrier to the uptake of PME. A major barrier against the uptake of PME was the time required for the examination, 134 (73.6%). The cost of accessing the service was another major barrier mentioned by about 6 of 10 respondents, 109 (59.9%). The least mentioned barrier is fear of the test result, 38 (20.9%). Details are as shown in Table 3.

Going for general physical examination was the component of PME perceived to be relevant by most of the respondents, 306 (93.9%). This was followed by the proportion of respondents that perceived HIV screening to be relevant, 303 (92.9%). Other tests perceived to be relevant in PME were

Table 2: Awareness of the components of periodic medical examination

Variable	Frequency (%), <i>n</i> =328
Audiometry tests	196 (60.1)
Stool test for occult malignancy	202 (62.0)
Mammography	231 (70.9)
Pap smear test	245 (75.2)
Cholesterol measurement	246 (75.5)
Electrolyte Urea and creatinine	252 (77.3)
Full blood count, differentials, and blood film	264 (81.0)
Electrocardiography	265 (81.3)
Hepatitis B screening test	283 (86.8)
Eye check	285 (87.4)
Weight and height for BMI	296 (90.8)
Clinical breast examination	298 (91.4)
General physical examination	299 (91.7)
Blood glucose check	301 (92.3)
Dental check	309 (94.8)
HIV screening test	311 (95.4)
Blood pressure check	315 (96.6)

Multiple Response Analysis. BMI: Body mass index

Table 3: Respondents' perceived barriers to the uptake of periodic medical examination (*n*=328)

Variables	Number of responses	Percentage of cases
Time factor	134	73.6
Cost	109	59.9
Lack of interest	48	26.4
Not certain which test is applicable	42	23.1
Fear of test result	38	20.9

Multiple response analysis

hepatitis B virus screening, 297 (91.1%), body mass index, 297 (91.1%), dental, 294 (90.2%), and blood pressure check, 294 (90.2%). Stool test for occult malignancy, 147 (45.1%), and mammography, 149 (45.7%), recorded the least relevant perception. The perception of susceptibility to most diseases preventable by periodic medical screening was poor among majority of the respondents, 230 (70.1%). The attitude of majority of the respondents, 306 (93.3%), toward PME was good, while more than half of the respondents, 186 (56.7%), had an intention to uptake PME, as shown in Table 4.

There was a significant association between perceived susceptibility to diseases and uptake of PME. A higher proportion of respondents with a poor perception of susceptibility, 74 (32.2%), uptake PME more compared with those with a good perception of susceptibility, 19 (19.4%), $P = 0.019$. Furthermore, a significantly higher proportion of those without a perceived barrier, 53 (34.0%), had an uptake of PME compared with those having barriers toward the uptake of PME, 40 (23.3%), $P = 0.031$. Other respondents' characteristics that had significant associations with the uptake of PME were years already spent on campus and intention to uptake PME, as shown in Table 5.

Table 4: Attitude, perception, and uptake of periodic medical examination by the respondents

Perceptions	Frequency (%), (<i>n</i> =328)
Perceived susceptibility	
Poor	230 (70.1)
Good	98 (29.9)
Perceived barriers	
No	154 (47.0)
Yes	174 (53.0)
Attitude toward PME	
Poor	0 (0.0)
Fair	22 (6.7)
Good	306 (93.3)
Intention to uptake PME	
No	142 (43.3)
Yes	186 (56.7)

PME: Periodic medical examination

Table 5: Association between respondents' characteristics and uptake of periodic medical examination

Variables	Uptake of PME		Statistics
	Yes, <i>n</i> (%)	No, <i>n</i> (%)	
Attitude			$\chi^2=0.139$; $P=0.709$
Fair	7 (31.8)	15 (68.2)	
Good	86 (28.1)	220 (71.9)	
Perceived susceptibility			$\chi^2=5.530$; $P=0.019$
Poor	74 (32.2)	156 (67.8)	
Good	19 (19.4)	79 (80.6)	
Perceived barriers			$\chi^2=4.626$; $P=0.031$
No	53 (34.0)	103 (66.0)	
Yes	40 (23.3)	132 (76.7)	
Intention to uptake PME			$\chi^2=63.629$; $P<0.001$
No	8 (5.6)	134 (94.4)	
Yes	85 (45.7)	101 (54.3)	
Religion			$\chi^2=7.463$; $P=0.06$
Christianity	74 (25.8)	213 (74.2)	
Islam	19 (46.3)	22 (53.7)	
Sex of respondents			$\chi^2=0.195$; $P=0.659$
Female	43 (27.2)	115 (72.8)	
Male	50 (29.4)	120 (70.6)	
Level of education			$\chi^2=8.383$; $P=0.039$
300	16 (34.0)	31 (66.0)	
400	40 (27.4)	106 (72.6)	
500	14 (18.2)	63 (81.8)	
600	23 (39.7)	35 (60.3)	
Course of study			Likelihood-ratio=5.392; $P=0.145$
Medicine	41 (26.1)	116 (73.9)	
Dentistry	7 (17.9)	32 (82.1)	
Nursing	33 (36.3)	58 (63.7)	
Medical rehabilitation	12 (30.0)	28 (70.0)	
Age (mean±SD)	23.5±2.5	23.2±2.7	$t=-0.804$; $P=0.422$

PME: Periodic medical examination, SD: Standard deviation

The intention to uptake PME was a significant determinant of PME uptake. The odds of respondents with an intention

to uptake PME was 18.3 times the odds of uptake among respondents without a similar intention, $P < 0.001$. The odds of uptake of PME among people with a high perceived barrier to the uptake of PME were less, 0.3 relative to people with a low perceived barrier, $P < 0.001$. Respondents with high perceptions of their susceptibility to diseases were observed to have less likelihood of taking part in PME (odds ratio = 0.440, $P = 0.017$), as shown in Table 6.

DISCUSSION

Awareness of PME was very high among the respondents. This could be due to their level of education and prior sensitization

Table 6: Determinants of uptake of periodic medical examination among undergraduate students of health sciences in Nigeria

Variables	Adjusted odds ratio	P	95% CI
Level			
300	Ref		
400	0.906	0.845	0.336-2.441
500	0.689	0.586	0.181-2.628
600	1.917	0.351	0.488-7.534
Perceived susceptibility			
Poor	Ref		
Good	1.750	0.102	0.894-3.425
Perceived barrier			
Low	Ref		
High	0.315	<0.001	0.172-0.577
Intention to uptake PME			
No	Ref		
Yes	18.279	<0.001	7.946-42.046
Religion			
Christianity	Ref		
Islam	0.185	0.185	0.260-1.297
Department			
Medicine	Ref		
Dentistry	0.664	0.438	0.235-1.870
Nursing	1.934	0.177	0.742-5.037
Medical rehabilitation	2.147	0.129	0.800-5.763

PME: Periodic medical examination, CI: Confidence interval

on preventive health screening during the mandatory preadmission screening at the school health center. The level of awareness was higher among the respondents, about 9 out of 10, compared with a similar study conducted among undergraduate students in Kaduna^[15] and much higher than the 67% found among the medical and nonmedical students studied in a Pakistan university.^[10] It is not surprising however that the level of awareness of PME was slightly higher in the study conducted among health workers in Sokoto.^[16] The higher level of awareness of PME among respondents in Sokoto could be due to variation in the years of experience. The study was conducted among health-care workers, while this study was conducted among health science students.

The most commonly mentioned test as a component of PME was a blood pressure check. This could be due to hypertension being a common chronic non-communicable disease. HIV screening and breast examination are promoted by both governmental and non-governmental agencies; screening services are also made readily available. These could account for the high level of awareness of HIV screening among the respondents. Tests such as audiometry and stool test recorded the least level of awareness. This could be due to the tests not being readily available in the study area. A similar study conducted in the South-East of Nigeria showed that general medical examination was the most commonly mentioned component of PME, followed by blood pressure check.^[21]

The uptake of PME was poor among a majority of the respondents. About 3 of 10 respondents had ever partaken in a PME. The poor uptake of PME was similar to findings from various studies conducted among various groups. The uptake was however higher in a study conducted among Pakistani medical students and nonmedical students.^[10] Furthermore, a higher proportion of about 7 of 10 respondents had undergone PME in a similar study conducted in Tema, Ghana.^[14] The study in Ghana was among adults above 18 years and respondents above 50 years accounted for a larger proportion of respondents who had undergone PME. This was contrary to the age range in this study where the upper limit of the age of respondents was 35 years. The variation in the uptake of PME could be due to poor perception of susceptibility to diseases that can be

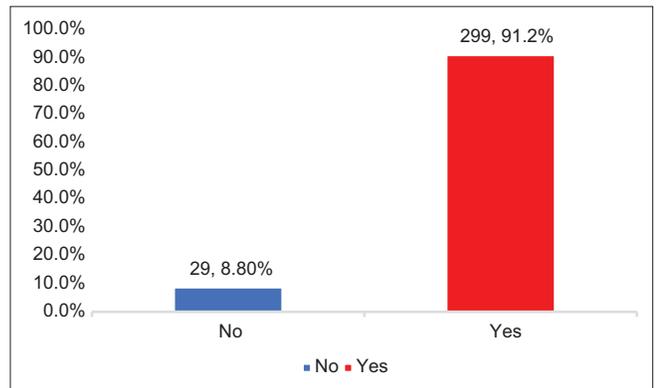


Figure 1: Awareness of Periodic Medical Examination among respondents

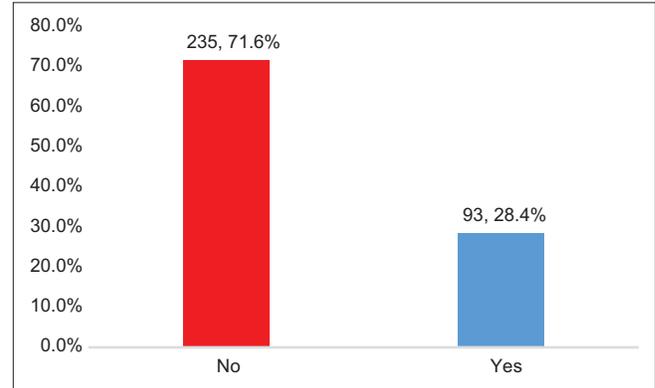


Figure 2: Uptake of Periodic Medical Examination by the respondents

prevented through PME because majority of the respondents had a poor perception of susceptibility.

More than half of the respondents had at least one perceived barrier against the uptake of PPE. Respondents with at least one barrier toward accessing PME had less odds of undergoing PME. The most common barrier toward the uptake of PME was time factor. This could be due to the bottleneck arising from protocols involved in accessing health care. The long waiting time to get the results of some investigations may also have contributed to the poor uptake of PME. This was similar to the findings in similar studies where time to access PME was a major challenge.^[10,15] The age of the respondents had no significant association with the uptake of PME. This could be because majority of the respondents were within the same age range, all being undergraduate health science students. Age was also not a significant factor affecting the uptake of PME in a similar study conducted among residents of Nnewi in the South-East of Nigeria.^[21] Age was however a significant factor affecting the uptake of PME in studies conducted among residents of Owo in the South-West of Nigeria and residents of Tema in Ghana. People of the older age group were observed to undergo PME relative to the younger population.^[9,14]

The cost of service was another major barrier identified among 6 of 10 respondents. This could be due to the noncoverage of PME by the students' social health insurance. Other identified barriers were lack of interest and fear of the outcome of PME. These were similar to the findings conducted among undergraduate students in Kaduna and health-care workers in Sokoto, Nigeria.^[15,16] Having an intention to uptake PME was a high and significant predictor of eventual uptake of PME, while people with high perceptions of barriers to its uptake have a low probability of eventual uptake of PME, as found in this study.

CONCLUSION

The utilization of PME was poor among the respondents despite being health science students and their high level of awareness of PME. The major determinants of the uptake of PME were the intention to uptake the service and perception of barriers toward accessing the services. Hence, there is a need to create an enabling environment through policy formulation aimed at addressing common barriers affecting the uptake of PME. This should include expanding the coverage of students' health insurance policies to cover PME and making its uptake mandatory. Furthermore, health education coupled with effective communication between the students and health-care providers, will address the challenges of uncertainty about tests that will apply to the prospective clients and fear of the outcome or results.

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Conflicts of interest

There are no conflicts of interest.

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