

Awareness, Knowledge and Risk Perception of Chronic Diseases among University Students in Nigeria: Implications for Early Detection Strategies

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Abstract *The prevalence of chronic diseases is rising among younger individuals, yet there is a notable deficiency in both awareness and preventive strategies within various low- and middle-income countries. Gaining insights into young adults' awareness, knowledge, and perceptions is crucial for developing effective intervention programs. This study aimed to assess young adults' awareness, understanding, and perceptions of chronic diseases among students in tertiary institutions in Nigeria. A cross-sectional survey was conducted among 500 undergraduate students selected from Ambrose Alli University in Nigeria, with a total student population of 27,388. Data collection used a structured, self-administered questionnaire to assess awareness, knowledge of risk factors and symptoms, and perceptions of risk and severity. Data were analyzed using SPSS. Many participants demonstrated a general understanding of chronic conditions such as hypertension and diabetes. The average level of knowledge was 3.98 (SD = 1.36), with a possible range of 0 to 9. Nonetheless, respondents showed insufficient knowledge of early signs, symptoms, and related risk factors. Many respondents believed that these illnesses primarily affect older people, which contributed to a reduced sense of personal risk. Furthermore, misconceptions surrounding the onset and prevention of these diseases were observed. Although young adults show significant awareness of chronic diseases, important gaps remain in their knowledge and perceptions of risk. Therefore, targeted health education programs are essential to reduce behaviours that could hinder early detection and prevention of these conditions.*

Keywords Awareness, Chronic Diseases, Knowledge, Nigeria, Perception, Young Adults.

Introduction

Chronic diseases are long-term conditions that typically develop over several years. These diseases, also known as non-communicable diseases (NCDs), cannot be transmitted from one person to another. They are often influenced by genetic and environmental factors, as well as personal behaviours and attitudes. Examples include cardiovascular diseases, diabetes, cancer, and chronic respiratory illnesses [1].

In Nigeria, especially regarding trends, the situation is characterised by the rise in the number of hypertension cases as well as the number of obese students in tertiary institutions. This is driven by unhealthy eating habits and low physical activity rates, as well as alcohol abuse, which complicates matters even more [3]. However, early-stage diagnosis rates remain low, partly because university healthcare centres lack necessary medical equipment, regular check-ups are uncommon, and students are often unaware of their health status. Nigeria is a low- to middle-income country, whose prevalence of diabetes, hypertension, and cardiovascular disorders is steadily rising. In this framework, university students constitute a valuable population for studying awareness and knowledge of diabetes [4]. University students are generally young adults in a transitional life stage, during which lifelong habits and health behaviours are established.

A study conducted among students at Nigerian universities indicates that although there is some general knowledge of diabetes, significant gaps remain in understanding its pathogenesis, risk factors, and prevention. A survey conducted among undergraduates across different tertiary institutions revealed that 85% of participants were aware that diabetes is a chronic disease, but more than half had limited knowledge of diabetes self-management [5]. This means that simple awareness is not the same as understanding the disease mechanisms

or the methods of its successful management. Another study in Osun State found that 75.9% of undergraduates understood diabetes, but only 40.4% could define it accurately, and many could not suggest viable prevention measures [16]. These results suggest that in-depth disease knowledge may not translate into optimal health behaviours or reduced vulnerability.

A large cross-sectional study among Nigerian university students demonstrated that although most could identify specific risk factors for CVD, especially psychological stress, very few believed they were personally at risk of the condition [6]. This reflects a general trend in health behaviour research, in which people may have only basic knowledge of a disease yet cannot internalise it in a way that changes their health decisions. That is, knowledge is at the intellectual level but does not always lead to preventive health behaviour or to perceived vulnerability [2].

Perceived personal risk is low when awareness is present for some conditions, such as CVDs. There is also research showing that although many students are aware of CVD risk factors in classroom settings, they fail to translate this awareness into their health status [6]. This lack of perceived personal vulnerability may reduce motivation to follow preventive strategies such as exercise and a healthy diet.

Although previous studies have assessed awareness of chronic diseases, few have simultaneously examined awareness, knowledge and risk perceptions among young adults within tertiary institutions using an integrated network. This study provides a comprehensive analysis of these factors and highlights their implications for early detection strategies in resource-limited settings.

Methodology

Setting of the Study

Ambrose Alli University (AAU) is among the top universities in Nigeria for its notable contributions to national educational

frameworks, with a total of 27,388 students [24]. AAU is located in Ekpoma, Edo State, in a local government area and a Semi-Urban Community, and it currently serves a wide range of youth from diverse socio-economic backgrounds, with a focus on public health research. This diversity enhances student representation across academic disciplines, enriching insights into variations in health awareness.

Sample Size Determination

To perform the quantitative evaluation, a targeted sample of 300 to 500 undergraduate students was selected based on recommendations from cross-sectional studies primarily focused on large populations. Moreover, Cochran's formula was used at the 95% confidence level to determine the minimum sample size, with a 5% margin of error. To identify incomplete or non-potential responses during data collection, the sample size was increased beyond the minimum threshold to ensure adequate generalizability and power [8,9]. A sample size of 500 was calculated using Cochran's formula.

Sample Size Determination

Sample size was determined based on Yamane's (1967) formula for finite populations as:

Sample Size Calculation

Formula used for sample size calculation:

$$N = N / [1 + N(e^2)]$$

Where:

N = required sample size

N = total population (27,388 students)

E = margin of error (0.05 at 95% confidence level)

Substituting the values:

$$N = 27,388 / [1 + 27,388(0.05^2)]$$

This formula gave us a minimum sample size of about 394 people. To account for potential nonresponse and incomplete questionnaire

responses, we added an additional 20% to the sample, bringing the total to 473 respondents. Nevertheless, 500 questionnaires were used to improve response reliability and ensure sufficient representation of our population.

Sampling Technique for Sample Selection

A multistage sampling method was used to recruit participants from AAU in three key states, and the study was conducted over a one-week period. In the first stage, faculty members were randomly selected across disciplines. In the second stage, a random department section was performed between the selected faculties. Moreover, in stage three, participant selection was conducted using systematic protocols based on an eligibility criterion, ensuring that diverse academic backgrounds were accurately represented. Through this approach, the risk of sampling bias was reduced, and a comprehensive representation of the sample across diverse academic contexts was achieved.

The reliability test of the two perceived-susceptibility items (probably the reversed-scored susceptibility item and the worry about consequences item) yielded a negative Cronbach's alpha of -0.113, based on only two items. A negative alpha indicates very low response consistency across the scale, unacceptable internal consistency, and failure to meet the basic assumptions of the Cronbach alpha reliability model [7].

This research was conducted to evaluate the item content and ensure that the two items measure conceptually distinct constructs. The results show measures of perceived susceptibility (personal vulnerability to the chronic disease) and perceived severity (worry about the consequences of a diagnosis). Negative Cronbach's alpha in two-item scales is especially widespread when one of the items is reverse-coded or when constructs diverge, and it does not necessarily imply low-quality data but rather a mis-specified measurement model [10]. Consequently, the items were analysed as single-item measures, a widespread

and justifiable approach in an HBM-grounded study when multi-item scales lack sufficient internal consistency or when constructs are theoretically distinct [11].

Inclusion Criteria:

1. Undergraduate students at Ambrose Alli University.
2. Ages ranging from 18–30 years.
3. Willingness to provide informed consent.

Exclusion Criteria:

1. Postgraduate students.
2. Undergraduates outside the specified age range.
3. Individuals declining participation.

Data Analysis and Processing

The data collected through the self-administered structured questionnaires were processed and analysed in version 26 of the Statistical Package of the Social Sciences (SPSS). This software is well regarded in public health research for its reliability and ability to process large volumes of data [12].

Data Processing

Every completed questionnaire was checked for completeness and consistency before the data were entered into SPSS. All questionnaire questions were assigned numerical codes according to a predefined coding scheme. The errors were identified during data cleaning; missing values and outliers were handled using appropriate statistical tools, i.e., by excluding cases or imputing missing data, depending on the type of missingness. This ensured that the dataset was validated before analysis [15].

The sample size for this research was calculated using Yamane's (1967) formula tailored for finite populations [23]. With a total student population of 27,388 and a desired margin of error of 5%, the initial sample size was determined to be 394. To mitigate issues with non-responses and incomplete questionnaires, an additional 20% was added, bringing the revised sample size to 473. Ultimately, 500 questionnaires were distributed to enhance response reliability and ensure the study population was adequately represented.

Results

The study sample consisted of 500 undergraduate students. 88% (n = 440) of the respondents reported having undergone at least one form of health screening. On the other hand, only 12% (n = 60) of the respondents had never been screened. In this test, screening uptake refers to having undergone any preventive health check/test with the intent of detecting chronic disease risk factors early [2]. Examples of preventive health checks/tests may include (but are not limited to) blood sugar, blood pressure, cholesterol, and other relevant health assessments. The largest groups in the most common age (peaks) are shown in Figure 1.

- Age 26: 41 respondents (8.2%) is the *highest / modal age*
- Age 22: 39 (7.8%)
- Age 31: 38 (7.6%)
- Age 21: 36 (7.2%)
- Age 23: 35 (7.0%)

So, while respondents are spread across ages, the mid-20s, especially 22–26, is the strongest cluster.

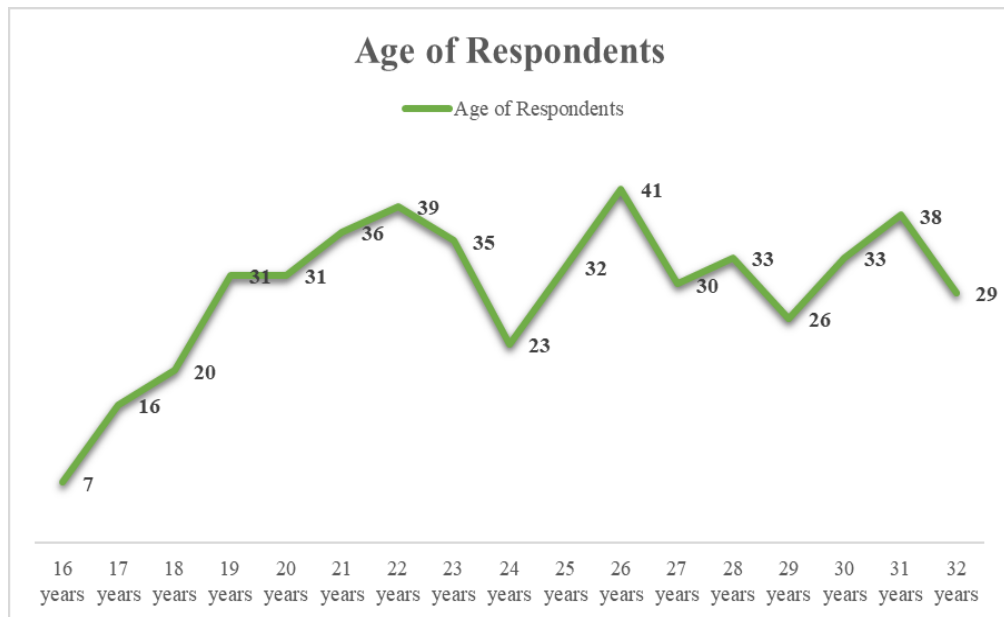


Figure 1. Age of Respondents

Since the mean age of the sample is approximately 24.8 years ($SD = 4.5$), it is confirmed that the sample predominantly comprises young adults, who are in their late teens to late twenties. The age of participants aligns perfectly with the study's target population, i.e., adults in their late teens to late twenties.

Looking at participants' educational levels further confirms that the age range aligns with the target population of university undergraduates and reflects a life stage in which

establishing healthy behaviours (such as screening practices) is very important, as noted by Claire et al. [22].

In broader way, the gender distribution in sample seems to be fairly balanced because 48.2% ($n = 241$) of the participants were males while the remaining 51.8% ($n = 259$) of them were females—as shown in Table 1 portrayed that out of 500 respondents, 241 were male, who constituted 48.2% of the total sample and 259 were female, who constituted 51.8% of the total sample.

Table 1. Gender of Participants

Sex	Frequency	Percent	Valid Percent	Cumulative Percent
Male	241	48.2	48.2	48.2
Female	259	51.8	51.8	100.0
Total	500	100.0	100.0	

Figure 2 shows a broad representation across fields of study, suggesting that the findings on health knowledge and screening behaviour are not limited to a particular academic

background. It also reduces the risk of bias that might occur if, say, mostly health science students (who might have higher health awareness) were surveyed.

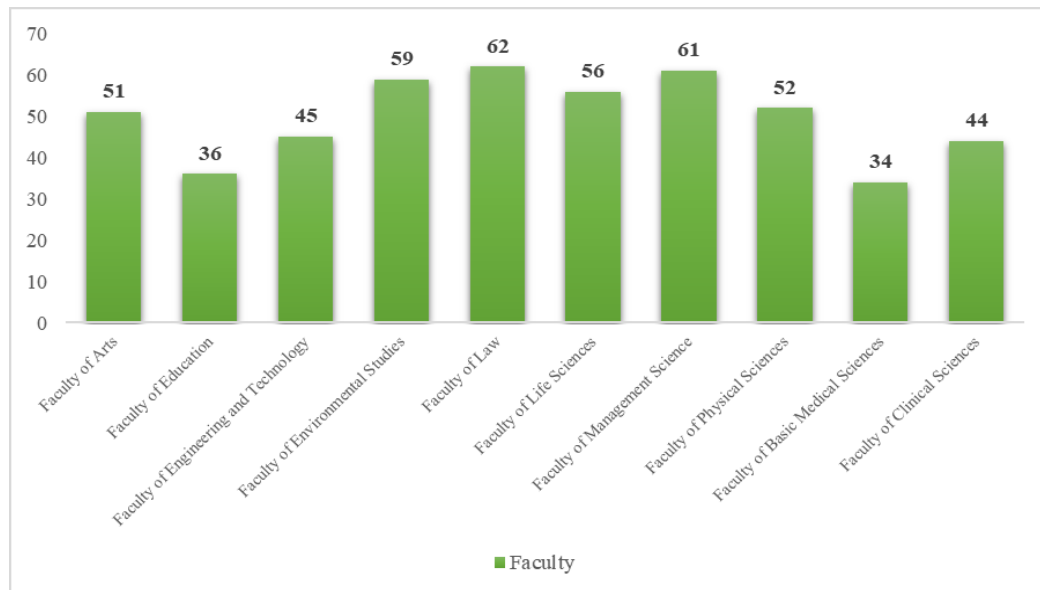


Figure 2. Faculty of Study

Knowledge Level – Knowledge of Chronic Disease Risk Factors

Table 2 showed that the respondents' knowledge of the risk factors for chronic diseases and the importance of early diagnosis was quite moderate. The average level of knowledge was 3.98 (SD = 1.36), with a possible range of 0 to 9. This implies that knowledge levels are generally low to

moderate. Therefore, only a small number of students understand chronic disease prevention moderately, and almost no students scored in the high range of knowledge. The importance of this result lies in a knowledge gap among university students regarding health-related issues, and the outcomes are not new, as past research in Nigeria has shown that students are aware of health-related diseases.

Table 2. Descriptive Statistics

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Knowledge score	500	.00	8.00	3.9760	1.35614
Valid N (listwise)	500				

The findings of the chi-square test in Table 3 (Pearson $\chi^2 = 1.627$, $df = 2$, $p = 0.443$) suggest that the relationship between knowledge level (poor, fair, or good) and screening uptake (ever screened vs never screened) is not statistically significant among the 500 undergraduate respondents. The test value ($p = 0.443$) is not significant at the conventional significance level (0.05), so we cannot reject the null hypothesis of independence. There is consistency in the non-significance of the likelihood ratio (1.448, $p = 0.485$) and linear-by-linear relation (1.108, $p = 0.293$). Although the expected value was

less than 5 (the smallest, 1.68), which was expected given 1 cell (16.7), this violation is insignificant in a very large population ($N = 500$). However, it does not undermine the test's overall reliability under such circumstances, as the chi-square test is robust with large sample sizes (Turhan, 2020). The cross-tabulation demonstrates that screening uptake is high across all knowledge categories (89.5% in poor, 87.5% in fair, 78.6% in good) and therefore supports the idea that knowledge level is not a significant predictor of screening behaviour in this demographic [14].

Table 3. Chi-square Results: Knowledge Level and Uptake of Screening Services

Chi-Square Tests	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.627 ^a	2	0.443
Likelihood Ratio	1.448	2	0.485
Linear-by-Linear Association	1.108	1	0.293
N of Valid Cases	500		

The cross-tabulation in Table 4 of perceived susceptibility (reversed-scored Likert item d1 R, where 1 = strongly disagree/low perceived risk and 5 = strongly agree/high perceived risk) versus screening uptake (screened any: 0 = never screened, 1 = ever screened) demonstrates that screening participation is always high at all levels of perceived susceptibility. Only 84.9% (n = 90) of those who reported the lowest perceived risk (score 1.00) had been screened, compared with 15.1% (n = 16) who were not screened. This trend continues with intermediate levels 88.7% uptake at the score (n = 102/115), 92.9% uptake at the score (n = 91/98), 83.2% uptake at the score (n = 79/95), and even stronger with the highest perceived risk (score 5.00, n = 86) with 90.7% (n = 78) reported screening [13, 19].

The uptake is 88 (440/500), and the never-screened group (n = 60, 12) is relatively evenly distributed across levels of susceptibility (there

is no evident focus at either end, low or high risk). The Pearson chi-square test yields a p-value of 0.206, indicating that perceived susceptibility and screening behaviour are not statistically significantly related. The confidence of the chi-square assumption of reliable inference is 10.32, and it was established that the insignificance was not a result of small cell counts [21].

The outcomes of the research in this instance are drastic and intuitive. The theoretical model, embodied in the Health Belief Model (HBM), holds that a higher degree of perceived susceptibility to developing a chronic illness, such as hypertension or diabetes, is a powerful predictor of preventive behaviour, including screening. The data, however, indicate that uptake is consistently high, regardless of whether students strongly agreed that they were at risk within the next decade.

Table 4. Perceived Susceptibility vs Screened Uptake

(Perceived susceptibility (reversed) * screened any Crosstabulation)

Perceived susceptibility (reversed)	Statistic	.00	1.00	Total
1.00	Count	16	90	106
	% within Perceived susceptibility (reversed)	15.1%	84.9%	100.0%
	% within screened_any	26.7%	20.5%	21.2%
2.00	Count	13	102	115
	% within Perceived susceptibility (reversed)	11.3%	88.7%	100.0%
	% within screened_any	21.7%	23.2%	23.0%
3.00	Count	7	91	98
	% within Perceived susceptibility (reversed)	7.1%	92.9%	100.0%
	% within screened_any	11.7%	20.7%	19.6%
4.00	Count	16	79	95
	% within Perceived susceptibility (reversed)	16.8%	83.2%	100.0%
	% within screened_any	26.7%	18.0%	19.0%

5.00	Count	8	78	86
	% within Perceived susceptibility (reversed)	9.3%	90.7%	100.0%
	% within screened_any	13.3%	17.7%	17.2%
Total	Count	60	440	500

The chi-square test values (Pearson $\chi^2 = 5.905$, $df = 4$, $p = 0.206$) in Table 5 indicate that there is no statistically significant relationship between perceived susceptibility (reversed-scored 5-point Likert item, 1 = low perceived risk to 5 = high perceived risk) and screening uptake (ever screened vs. never screened) among the 500 undergraduates. This

non-significant result is supported by the likelihood ratio (6.008, $p = 0.199$) and the linear-by-linear association (0.327, $p = 0.567$). Most importantly, zero cells (0.0%) had anticipated values under 5. The lowest anticipated value was 10.32, which met the chi-square test requirements perfectly, and the p -value could be trusted [13, 19].

Table 5. Chi-Square Perceived Susceptibility vs Screened Uptake

Test	Value	df	Asymptotic Significance (2-sided)
Chi-Square Tests			
Pearson Chi-Square	5.905 ^a	4	.206
Likelihood Ratio	6.008	4	.199
Linear-by-Linear Association	.327	1	.567
N of Valid Cases	500		

Discussion

Knowledge of risk factors for chronic diseases was low to moderate, with most students classified as fair and only a few demonstrating a good level of knowledge. However, screening uptake was high across all levels of knowledge. The lack of a significant relationship indicates that knowledge is not the motivating factor for preventive health behaviour in this case. This challenges the traditional belief that greater awareness will lead more people to participate in screening.

In addition, there was no significant impact of perceived susceptibility and perceived severity, important constructs of the Health Belief Model, on screening uptake. Students who perceived themselves as low risk or were less concerned about the severity of the chronic disease had an equal likelihood of having the screening performed as those who were perceived to be at higher risk or more concerned. This implies that individual attitudes towards risk and perceived disease

severity are not particularly influential in shaping behaviour among this group. These results help emphasise the fact that the superficial knowledge is not always the same as in-depth knowledge - a trend which seems to be relevant in our sample as well. Research studies have demonstrated that knowledge can be enhanced to enhance attendance to preventive and early detection interventions. The article on health literacy by Nutbeam highlights that increased awareness and knowledge of disease risks are more likely to promote preventive behaviours (such as screening) [20]. Put differently, the more students learn about the dangers of chronic diseases and the benefits of early detection, the more willing they tend to be to perform screening and other preventive health actions [16]. A possible obstacle to informed health decision-making is evident in the largely positive to poor levels of knowledge observed in this sample. However, as the results show, despite these knowledge constraints, screening adoption rates were high, which may

indicate that other factors prompt students to undergo screening.

The findings are explained using the Health Belief Model (HBM): greater knowledge of risk factors, symptoms, and screening benefits is associated with greater perceived benefits and cues to action, which, in turn, lead to increased screening. Nevertheless, the near-homogeneous high uptake (ranging from 78.6% in good knowledge to 89.5% in poor knowledge) does not support this expectation. It is inconsistent with much of the Nigerian literature, which often associates low-to-moderate knowledge with delayed or absent preventive behaviours among young adults [17, 18].

The results implied that the tertiary setting is not inherently knowledge-seeking but can be driven by external structural facilitators, such as regular campus health promotions, free or low-cost university clinic services, mandatory medical examinations at registration, or even health-seeking norms normalised by peers, which override individual cognitive deficits. This observation aligns with the Social Ecological Model (SEM), embedded in the conceptual framework, which emphasises institutional and environmental factors rather than exclusively individual-determined ones. The low mean knowledge score (3.98 out of 9) also supports the existence of a literacy gap. However, it does not play a decisive role in stopping action, suggesting that knowledge-only interventions (e.g., health education workshops) might have a small incremental effect on uptake in such institutional settings [13].

Moreover, the inferential analysis showed that the variables obtained using the Health Belief Model, i.e., knowledge, perceived susceptibility, and perceived severity, did not have significant predictive power for screening behaviour. Equally, barriers that are commonly cited, such as cost, insufficient time, insufficient information, and perceived need, have no significant effect on uptake. The findings are consistent with studies in other

low- and middle-income countries, suggesting that inadequate risk perception among young adults is a global challenge rather than a context-specific issue.

The findings also have important implications for public health policy in Nigeria. Integrating routine screening programs into tertiary institutions and leveraging digital platforms for awareness campaigns could significantly improve early detection among young adults.

Conclusion

This study highlights that awareness of chronic diseases is relatively high among young adults in Nigerian tertiary institutions; however, significant gaps remain in knowledge and perceptions. Misconceptions and low perceived susceptibility negatively impact behaviour and early detection

Recommendations

The following recommendations are invaluable for improving awareness, knowledge, and Risk Perception of Chronic Diseases among University Students in Nigeria.

1. Incorporation of chronic disease education in academic curriculum.
2. Encourage routine screening among young adults.
3. Implementation of targeted health education programs in a tertiary institution.
4. Awareness promotion and campaigns regarding the early onset of chronic diseases.
5. Accurate health care information dissemination with the use of digital platforms.

Conflict of Interest

The authors declare no conflict of interest.

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Author Contributions

Taiwo Akhigbe conceived the presented idea, planned and carried out the data collection, analysed the data and generated the manuscript. Osede Ignis Iribhogbe, review the titles and supervise the manuscript development.

References

- [1]. World Health Organisation. Noncommunicable diseases: Key facts. 2023. Available at: <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>
- [2]. World Health Organization. Cardiovascular diseases (CVDs). 2025. [online] World Health Organization. Available at: [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)).
- [3]. Adeloye D, Ige JO, Aderemi AV, et al. Estimating the prevalence, hospitalisation and mortality from type 2 diabetes mellitus in Nigeria: A systematic review and meta-analysis. *BMJ Open*. 2017;7(5).
- [4]. Kinash S, Crane L, Capper J, Young M, Stark A. When do university students and graduates know what careers they want: A research-derived framework. *Journal of Teaching and Learning for Graduate Employability*. 2017;8(1):3-21. <https://doi.org/10.21153/jtlge2017vol8no1art584>.
- [5]. Ogunmola OJ, Oladosu YO, Olamoyegun MA. Knowledge, attitude and practice of lifestyle modification in the management of diabetes mellitus among Nigerian students. *Journal of Preventive Medicine and Hygiene*. 2014;55(3):101-7.
- [6]. Coker OS, Akyala AI, Coker RB. Cardiovascular disease knowledge, risk perception, and lifestyle behaviors among university students in

Ethical Approval

Ethical approval was obtained from the Ambrose Alli University Research Review Board. Participation was voluntary, and informed consent was obtained. Confidentiality and anonymity were strictly maintained.

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Data Availability

The data for this study are available on direct request from the authors

- North-Central Nigeria: a cross-sectional study. *BMC Public Health*. 2025. <https://doi.org/10.1186/s12889-025-26071-z>
- [7]. Bonett DG, Wright TA. Cronbach's alpha reliability: Interval estimation, hypothesis testing, and sample size planning. *Journal of Organisational Behaviour*. 2015;36(1):3-15. <https://doi.org/10.1002/job.1960>.
 - [8]. Cochran WG. Sampling techniques. 3rd ed. Wiley; 1977.
 - [9]. Polit DF, Beck CT. Nursing research: Generating and assessing evidence for nursing practice. 11th ed. Wolters Kluwer; 2021.
 - [10]. Chan LL, Idris N. Validity and reliability of the instrument using exploratory factor analysis and Cronbach's alpha. *International Journal of Academic Research in Business and Social Sciences*. 2017;7(10):400-10. <https://doi.org/10.6007/ijarbss/v7-i10/3387>
 - [11]. Ahmad N, Alias FA, Hamat M, Mohamed SA. Reliability analysis: application of Cronbach's alpha in research instruments. *Pioneering the Future: Delving Into E-Learning's Landscape*. 2024:114-9. <https://doi.org/10.6007/ijarbss/v14-i9/22785>.
 - [12]. Pallant J. SPSS survival manual: A step-by-step guide to data analysis using IBM SPSS. 7th ed. McGraw-Hill Education; 2020.
 - [13]. Lugo-Armenta JG, Pino-Fan LR, Hernandez BRR. Chi-square reference meanings: A historical-

epistemological overview. *Revemop*. 2021;3. <https://doi.org/10.33532/revemop.e202108>.

[14]. Cohen J, Cohen P, West SG, Aiken LS. *Applied multiple regression/correlation analysis for the behavioural sciences*. Routledge; 2013. doi: <https://doi.org/10.4324/9780203774441>.

[15]. Field A. *Discovering statistics using IBM SPSS Statistics*. 5th ed. Sage Publications; 2018.

[16]. Omobuwa O, Alebiosu CO. Awareness of diabetes amongst undergraduates in a Nigerian university in Osun State, Nigeria. *African Journal of Medicine and Medical Sciences*. 2014;43(1):47-51.

[17]. Black W, Babin BJ. Multivariate data analysis: Its approach, evolution, and impact. In: *The great facilitator: Reflections on the contributions of Joseph F. Hair, Jr. to marketing and business research*. Cham: Springer International Publishing; 2019. p.121-30. [https://mvstats.com/wp-content/uploads/2022/01/Multivariate-Data-](https://mvstats.com/wp-content/uploads/2022/01/Multivariate-Data-Analysis_Its-Approach-Evolution-and-Impact.pdf)

[Analysis_Its-Approach-Evolution-and-Impact.pdf](https://mvstats.com/wp-content/uploads/2022/01/Multivariate-Data-Analysis_Its-Approach-Evolution-and-Impact.pdf).

[18]. Sperandei S. Understanding logistic regression analysis in behavioural health studies. *Brazilian Journal of Medical and Biological Research*. 2014;47(3):235-43.

[19]. Turhan H. Chi-square test: Basic principles and applications in medical research. *Journal of Medical Statistics and Informatics*. 2020;8(1):1-6.

[20]. Nutbeam D. Health literacy as a public health goal: A challenge for contemporary health education and communication strategies into the 21st century. *Health Promotion International*. 2000;15(3):259-67. <https://doi.org/10.1093/heapro/15.3.259>.

[21]. Franke TM, Ho T, Christie CA. The chi-square test: Often used and more often misinterpreted. *American Journal of Evaluation*. 2012;33(3):448-58. <https://doi.org/10.1177/1098214011426594>.

[22]. Claire Y, Jiang Y, Alvin W, Yeo TM, Lim ST, Wang W. Perceptions and intentions to prevent diabetes among at-risk individuals: A qualitative study using the Theory of Planned Behaviour. *Journal of Clinical Nursing*. 2025;34(7):2918-32. <https://doi.org/10.1111/jocn.17764>.

[23]. Yamane T. *Statistics: An introductory analysis*. 2nd ed. Harper & Row; 1967.

[24]. Mediterranean Publications. Student population and academic structure of Ambrose Alli University, Ekpoma (AAU), Edo State. [date unknown]. Available at: <https://mediterraneanpublications.com>.