

# Perceptions of Healthcare Services under the Tertiary Institutions Social Health Insurance Programme (TISHIP) among Students of Federal Tertiary Institutions in Kaduna State, Nigeria: A Comparative Cross-Sectional Study

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## Abstract

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**Background:** The Tertiary Institutions Social Health Insurance Programme (TISHIP) provides health insurance support for students in Nigerian tertiary institutions. Assessing students' awareness, reported utilisation-related activity and perceptions of healthcare services can provide information on programme implementation and service delivery. To assess awareness, reported utilisation-related activity and perceptions of healthcare services among students in three federal tertiary institutions in Kaduna State, Nigeria, and compare these measures across the institutions.

**Methods:** A comparative cross-sectional study was conducted among students of Ahmadu Bello University, Zaria; Federal Polytechnic Kaduna; and Federal College of Education, Zaria. The institutions were purposively selected and a multistage sampling procedure was used. A total of 560 questionnaires were administered and 400 sufficiently complete questionnaires were analysed. Data were collected using a structured questionnaire covering socio-demographic characteristics, TISHIP awareness, reported utilisation-related activities and perceptions of healthcare services. Perceptions were assessed using the 18-item Patient Satisfaction Questionnaire Short Form (PSQ-18). Descriptive statistics, analysis of variance, Welch's analysis of variance, Pearson correlation and multivariable linear regression were used. Statistical significance was set at  $p < 0.05$ .

**Results:** Only 133 (33.3%) respondents reported awareness of TISHIP. The overall reported utilisation-related activity score was  $2.25 \pm 0.45$  on a five-point frequency scale. The overall mean PSQ-18 score was  $3.14 \pm 0.28$ . Mean scores were  $3.12 \pm 0.29$  at Ahmadu Bello University,  $3.13 \pm 0.30$  at Federal Polytechnic Kaduna and  $3.16 \pm 0.25$  at Federal College of Education, Zaria. Welch's analysis showed no statistically significant difference in overall PSQ-18 scores across institutions ( $F(2,185.6) = 0.86$ ,  $p = 0.423$ ;  $\eta^2 = 0.004$ ). Significant institutional differences were observed in financial aspects ( $F(2,174.9) = 7.04$ ,  $p = 0.001$ ;  $\eta^2 = 0.045$ ) and accessibility/convenience ( $F(2,186.4) = 3.28$ ,  $p = 0.040$ ;  $\eta^2 = 0.017$ ). Reported utilisation-related activity was inversely associated with PSQ-18 score ( $r = -0.306$ , 95% CI:  $-0.392$  to  $-0.214$ ;  $p < 0.001$ ) and awareness ( $r = -0.335$ , 95% CI:  $-0.419$  to  $-0.245$ ;  $p < 0.001$ ). In adjusted analysis, institutional differences in overall PSQ-18 score remained non-significant.

**Conclusion:** Awareness of TISHIP was low and reported utilisation-related activity was limited among the surveyed students. Overall perceptions of healthcare services were similar across the three participating institutions, although financial and accessibility-related dimensions differed. Strengthening communication about TISHIP benefits and routinely monitoring specific dimensions of healthcare experience may help identify areas requiring service improvement. Because individual TISHIP enrolment and TISHIP-specific service use were not separately established, the utilisation and perception findings should not be interpreted as direct estimates of programme uptake or satisfaction among confirmed TISHIP service users.

**Keywords:** Tertiary Institutions Social Health Insurance Programme; TISHIP; student satisfaction; healthcare services; health insurance; Patient Satisfaction Questionnaire-18; tertiary institutions; Kaduna State; Nigeria.

## 17Introduction

Universal health coverage requires access to needed healthcare services without financial hardship.<sup>1</sup> Health insurance is an important mechanism for improving access and providing financial protection, particularly among populations with limited financial resources. In Nigeria, however, out-of-pocket payments continue to dominate health financing and remain an important barrier to healthcare access and a source of financial hardship for households.<sup>2</sup> Students in tertiary institutions constitute a large and relatively young population whose health can affect wellbeing, academic participation and educational outcomes. Access to acceptable, accessible and responsive healthcare is therefore an important component of student welfare.

In Nigeria, the Tertiary Institutions Social Health Insurance Programme (TISHIP) was established to provide health insurance support for students in tertiary institutions. The National Health Insurance Authority describes TISHIP as a healthcare support system for students in federal, state and private tertiary institutions, including universities, polytechnics and other tertiary institutions.<sup>3</sup> The programme operates within the framework of the National Health Insurance Scheme, and its mandate has been reinforced by the National Health Insurance Authority Act of 2022, which makes health insurance mandatory for all residents of Nigeria.<sup>4</sup> However, the existence of a health insurance programme does not necessarily translate into adequate awareness of its benefits, effective engagement with available services or favourable perceptions of

healthcare delivery.

Evidence from Nigerian tertiary institutions indicates variation in awareness, utilisation and perceptions of TISHIP. Anetoh et al. reported substantial gaps between awareness and actual benefit from TISHIP among students of Nnamdi Azikiwe University, Awka, with concerns relating to medicine availability, waiting time and provider attitudes.<sup>5</sup> Similarly, Aniwaada et al. reported limited awareness and utilisation of TISHIP among undergraduate students in Enugu State and identified service-related factors that influenced utilisation.<sup>6</sup> More recent evidence from Southwestern Nigeria also found limited knowledge of TISHIP among tertiary institution students, with knowledge varying according to institutional characteristics.<sup>7</sup> Studies examining satisfaction have also reported concerns about specific dimensions of healthcare delivery. A study conducted among students at the Ahmadu Bello University sick bay in Zaria reported an overall satisfaction level of 57.1%, with patient-provider relationships rated more favourably than waiting time.<sup>8</sup> A more recent qualitative study in Jos examined stakeholder satisfaction with TISHIP implementation and provided additional evidence from northern Nigeria on experiences associated with programme implementation.<sup>9</sup> These findings suggest that assessment of TISHIP should extend beyond awareness and utilisation to include students' perceptions of different dimensions of healthcare delivery.

Patient satisfaction is multidimensional and may reflect perceptions of technical quality, interpersonal interactions, communication, financial aspects, time spent with healthcare providers, and accessibility of care.<sup>10,11</sup> The Patient Satisfaction Questionnaire Short Form (PSQ-18) assesses seven domains: general satisfaction, technical quality, interpersonal manner, communication, financial aspects, time spent with the doctor, and accessibility and convenience.<sup>12,13</sup> A multidimensional instrument can therefore provide information about specific aspects of healthcare experience that may not be captured by a single global satisfaction question.

Much of the available Nigerian evidence has been generated from individual institutions or specific geographical settings, limiting direct comparison across different types of tertiary institutions. Differences in institutional structure, student characteristics, organisation of health services and programme implementation arrangements may influence students' perceptions of healthcare. Comparative quantitative evidence involving different categories of federal tertiary institutions in northern Nigeria remains limited.

In Kaduna State, universities, polytechnics and colleges of education operate within the federal tertiary education system. Comparing students' perceptions across these institutional settings provides an opportunity to examine whether reported awareness, utilisation-related activity and satisfaction differ across institution types. The present study therefore assessed TISHIP awareness, reported utilisation-related activity and perceptions of healthcare services among students in three federal tertiary institutions in Kaduna State, Nigeria, and compared these measures across the institutions.

## MATERIALS AND METHODS

### Study design and setting

A comparative cross-sectional study was conducted among full-time students of three federal tertiary institutions in Kaduna State, Nigeria: Ahmadu Bello University (ABU), Zaria; Federal Polytechnic Kaduna; and Federal College of Education (FCE), Zaria.

The three institutions were purposively selected because TISHIP was operational within the institutions and because they represented different categories of federal tertiary institutions. The comparison was intended to examine students' awareness, reported utilisation-related activity and perceptions of healthcare services across

different institutional settings.

### Study population

The study population comprised full-time students enrolled in the three selected institutions. The combined student population was 123,651, comprising 51,493 students at ABU, 39,786 at Federal Polytechnic Kaduna and 32,372 at FCE, Zaria.

Students enrolled as full-time students and who provided informed consent were eligible for participation. Part-time and distance-learning students and students who declined participation were excluded.

### Sample size determination

The minimum sample size was determined using the Taro Yamane formula:<sup>14</sup>

$$n = N / (1 + N(e)^2)$$

where n is the required sample size, N is the total study population and e is the desired level of precision.

Using a total student population of 123,651 and a precision level of 5%, the minimum calculated sample size was approximately 399 students. The target sample was increased to 560 students to provide additional allowance for non-response and incomplete questionnaires. The target sample was allocated proportionately according to institutional enrolment: 235 students from ABU, 179 from Federal Polytechnic Kaduna and 146 from FCE, Zaria.

The sample-size calculation was based on the overall student population and specified precision rather than on a prespecified effect size for institutional differences in satisfaction.

### Sampling procedure and participant recruitment

A multistage sampling procedure was used. First, the three federal tertiary institutions were purposively selected. Second, students within each institution were stratified according to the institutional academic structure and the allocated sample was distributed proportionately.

Within each institution, relevant faculties, schools or equivalent academic units were identified, after which departments were selected proportionately according to student enrolment. Eligible students within selected departments were recruited using systematic sampling from available student registers or, where registers were unavailable, from students present in selected lecture halls. Recruitment continued until the allocated sample for each institution was reached.

The researcher and five trained research assistants approached eligible students, explained the study objectives and procedures, and obtained written informed consent before questionnaire administration. A total of 560 questionnaires were administered: 235 at ABU, 179 at Federal Polytechnic Kaduna and 146 at FCE, Zaria. Four hundred sufficiently complete questionnaires were included in the final analysis.

### Data collection instrument

Data were collected using a structured self-administered questionnaire adapted from TISHIP operational materials and previous related work. The questionnaire comprised sections covering socio-demographic characteristics, awareness of TISHIP and its benefit package, reported utilisation-related activities and perceptions of healthcare services.

The questionnaire was reviewed by experts at Ahmadu Bello University for content relevance and clarity before administration. The PSQ-18 was incorporated into the questionnaire.

Importantly, the questionnaire did not contain a separate variable confirming individual TISHIP enrolment or identifying whether a respondent had specifically accessed a TISHIP-funded healthcare service during the recall period. Consequently, the study assessed perceptions among the surveyed students rather than satisfaction among a confirmed group of TISHIP service users.

### Measurement of TISHIP awareness

Awareness of TISHIP was assessed using questions concerning knowledge of the programme and its benefit package. Respondents were asked about selected services and benefits covered by the programme. Awareness responses were summarised using the study scoring procedure, with higher scores indicating greater awareness.

### Measurement of reported utilisation-related activity

Reported utilisation-related activity was assessed using 10 questionnaire items covering access to healthcare under TISHIP, specialist referral, collection of prescribed drugs without payment, hospital admission without payment, complaints to the appropriate authority, participation in health seminars or enlightenment programmes, access to dental services, seeking explanations about treatment, reading TISHIP information pamphlets, and laboratory investigations.

Respondents reported the frequency of each activity during the preceding six months using a five-point scale: Never (1), Rarely (2), Occasionally (3), Frequently (4), and Very frequently (5).

A composite utilisation-related activity score was calculated as the mean of the 10 items, with possible values ranging from 1 to 5. Higher scores indicated more frequently reported utilisation-related activity.

Because the questionnaire did not contain a separate measure confirming individual TISHIP enrolment or TISHIP-specific healthcare utilisation, this score was interpreted as a frequency-based measure of reported utilisation-related activity and **not as a direct measure of TISHIP uptake, coverage or enrolment.**

### Measurement of satisfaction

Perceptions of healthcare services were assessed using the 18-item Patient Satisfaction Questionnaire Short Form (PSQ-18). The instrument comprises seven domains: general satisfaction (items 3 and 17), technical quality (items 2, 4, 6 and 14), interpersonal manner (items 10 and 11), communication (items 1 and 13), financial aspects (items 5 and 7), time spent with the doctor (items 12 and 15), and accessibility/convenience (items 8, 9, 16 and 18).<sup>12,13</sup>

Each item was rated on a five-point response scale from Strongly Agree to Strongly Disagree. Responses were coded from 1 to 5, and negatively oriented items were reverse scored so that higher scores consistently represented more favourable perceptions. Items 1, 2, 3, 5, 6, 8, 11, 15 and 18 were reverse scored.

Domain scores were calculated as the mean of their constituent items. The overall PSQ-18 score was calculated as the mean of all 18 scored items, giving a possible range of 1–5. No arbitrary cut-off was used to classify respondents as satisfied or dissatisfied.

All 400 respondents included in the final analysis completed the 18 PSQ-18 items. Questionnaires with substantial missing information were excluded from the final analysis, and no missing-item imputation was performed.

The PSQ-18 was administered to the full study sample rather than being restricted to respondents with documented TISHIP-specific healthcare utilisation. Therefore, PSQ-18 scores were interpreted as respondents' perceptions of healthcare services and not as the proportion of confirmed TISHIP service users who were satisfied or dissatisfied.

### Data collection and quality control

Data were collected by the researcher and five trained research assistants. Research assistants were oriented on the study objectives, participant eligibility, questionnaire administration, informed consent and confidentiality. Completed questionnaires were checked for completeness before data entry.

### Data management and statistical analysis

Data were entered, cleaned and analysed using IBM SPSS Statistics version 27.0. Categorical variables were summarised using

frequencies and percentages, while continuous variables were summarised using means and standard deviations.

Awareness, reported utilisation-related activity and PSQ-18 scores were compared across the three institutions. One-way analysis of variance was used where the assumptions of homogeneity of variance were considered acceptable. Where variance heterogeneity was detected, Welch's analysis of variance was used as the principal test.<sup>16</sup> Levene's test was used to assess homogeneity of variance. The Kruskal-Wallis test was used as a sensitivity analysis for the overall PSQ-18 score because of the bounded and ordinal nature of the questionnaire-derived measure.<sup>17</sup>

Effect size was expressed using eta squared ( $\eta^2$ ), where appropriate. Ninety-five percent confidence intervals were reported for relevant estimates. Pearson correlation was used to assess associations between awareness, reported utilisation-related activity and overall PSQ-18 score. Correlation coefficients were interpreted as measures of association and not causation.

A multivariable linear regression model was fitted with the overall PSQ-18 score as the dependent variable and institution, sex, age group, accommodation and marital status as explanatory variables. Ahmadu Bello University, female sex, age 16–20 years, off-campus accommodation and single marital status were used as reference categories. Level of study was not included in the adjusted model because its coding differed across institutions and several categories were sparse.

Reported utilisation-related activity and satisfaction were analysed as separate constructs. Their mean scores were not directly compared using a paired t-test because they represent different concepts despite being measured on five-point scales.

Statistical significance was set at  $p < 0.05$ . Analyses were based on complete cases, and no imputation was undertaken for missing questionnaire data.

### Ethical considerations

Ethical approval was obtained from the Scientific and Ethical Committee of Ahmadu Bello University Teaching Hospital, Zaria, before commencement of the study. Administrative permission was obtained from the participating institutions. Written informed consent was obtained from all participants before questionnaire administration. Participation was voluntary, and information obtained from participants was treated confidentially and used solely for the purposes of the study.

## RESULTS

### Participant characteristics and analytical sample

A total of 560 questionnaires were administered across the three participating institutions. Four hundred sufficiently complete questionnaires were included in the final analysis, giving an overall analytical response proportion of 71.4%. The analytical sample comprised 203 (50.8%) respondents from Ahmadu Bello University, 74 (18.5%) from Federal Polytechnic Kaduna and 123 (30.8%) from Federal College of Education, Zaria.

The institution-specific analytical response proportions were 86.4% for Ahmadu Bello University (203/235), 41.3% for Federal Polytechnic Kaduna (74/179) and 84.2% for Federal College of Education, Zaria (123/146).

**Table 1. Participant flow and analytical sample by institution**

| Stage                              | ABU  | Federal Polytechnic Kaduna | FCE, Zaria | Total |
|------------------------------------|------|----------------------------|------------|-------|
| Questionnaires administered        | 235  | 179                        | 146        | 560   |
| Sufficiently complete and analysed | 203  | 74                         | 123        | 400   |
| Excluded from analysis             | 32   | 105                        | 23         | 160   |
| Analytical response proportion (%) | 86.4 | 41.3                       | 84.2       | 71.4  |

Among the 400 respondents, 150 (37.5%) were male and 250 (62.5%) were female. Most respondents, 202 (50.5%), were aged 21–25 years. A total of 261 (65.3%) lived on campus and 139

(34.8%) lived off campus. Regarding marital status, 189 (47.3%) were single, 182 (45.5%) were married, 20 (5.0%) were divorced and 9 (2.3%) were widowed.

**Table 2. Socio-demographic characteristics of respondents (n = 400)**

| Variable                            | Frequency | Percentage |
|-------------------------------------|-----------|------------|
| Sex                                 |           |            |
| Male                                | 150       | 37.5       |
| Female                              | 250       | 62.5       |
| Age group                           |           |            |
| Under 16 years                      | 13        | 3.3        |
| 16–20 years                         | 85        | 21.3       |
| 21–25 years                         | 202       | 50.5       |
| 26–30 years                         | 59        | 14.8       |
| 31 years and above                  | 41        | 10.3       |
| Institution                         |           |            |
| Ahmadu Bello University, Zaria      | 203       | 50.8       |
| Federal Polytechnic, Kaduna         | 74        | 18.5       |
| Federal College of Education, Zaria | 123       | 30.8       |
| Accommodation                       |           |            |
| On campus                           | 261       | 65.3       |
| Off campus                          | 139       | 34.8       |
| Marital status                      |           |            |
| Single                              | 189       | 47.3       |
| Married                             | 182       | 45.5       |
| Divorced                            | 20        | 5.0        |
| Widowed                             | 9         | 2.3        |

#### Awareness of TISHIP

Only 133 (33.3%) respondents reported awareness of TISHIP, while 267 (66.8%) reported that they were not aware of the programme.

**Table 3. Awareness of TISHIP among respondents**

| Awareness of TISHIP | Frequency | Percentage |
|---------------------|-----------|------------|
| Yes                 | 133       | 33.3       |
| No                  | 267       | 66.8       |
| Total               | 400       | 100.0      |

Awareness of individual benefit packages varied substantially. Awareness was highest for health promotion and prevention services, reported by 389 (97.3%) respondents, followed by consultation, treatment and prescribed drugs by 372 (93.0%), dental care by 369 (92.3%), and antenatal and delivery care by 362 (90.5%). Awareness was lowest for free hospital admission, reported by 14 (3.5%), and blood transfusion, reported by 61 (15.3%).

**Table 4. Awareness of TISHIP benefit packages**

| Benefit package                              | Aware n (%) | Not aware n (%) |
|----------------------------------------------|-------------|-----------------|
| Consultation, treatment and prescribed drugs | 372 (93.0)  | 28 (7.0)        |
| Health promotion and prevention services     | 389 (97.3)  | 11 (2.8)        |
| Specialist consultation                      | 176 (44.0)  | 224 (56.0)      |
| Surgical operation                           | 192 (48.0)  | 208 (52.0)      |
| Treatment of chronic diseases                | 198 (49.5)  | 202 (50.5)      |
| Laboratory investigations                    | 254 (63.5)  | 146 (36.5)      |
| Accident and emergency care                  | 286 (71.5)  | 114 (28.5)      |
| Antenatal and delivery care                  | 362 (90.5)  | 38 (9.5)        |
| Postnatal care                               | 266 (66.5)  | 134 (33.5)      |
| Free hospital admission                      | 14 (3.5)    | 386 (96.5)      |
| Dental care                                  | 369 (92.3)  | 31 (7.8)        |
| Blood transfusion                            | 61 (15.3)   | 339 (84.8)      |

#### Awareness score by institution

The overall mean awareness score was  $7.35 \pm 1.03$ . Mean scores were  $7.28 \pm 1.02$  at Ahmadu Bello University,  $7.32 \pm 1.17$  at Federal Polytechnic Kaduna and  $7.48 \pm 0.95$  at Federal College of Education, Zaria.

The variance assumptions were acceptable for the awareness score.

There was no statistically significant difference in awareness scores across the three institutions (one-way analysis of variance,  $F(2,397) = 1.521, p = 0.220$ ).

**Table 5. Awareness score by institution**

| Institution                         | n   | Mean $\pm$ SD   |
|-------------------------------------|-----|-----------------|
| Ahmadu Bello University             | 203 | $7.28 \pm 1.02$ |
| Federal Polytechnic Kaduna          | 74  | $7.32 \pm 1.17$ |
| Federal College of Education, Zaria | 123 | $7.48 \pm 0.95$ |
| Overall                             | 400 | $7.35 \pm 1.03$ |

#### Reported utilisation-related activity

The reported utilisation-related activity score was based on the frequency with which respondents reported engaging in 10 assessed activities during the preceding six months. Laboratory investigations had the highest mean score ( $3.26 \pm 1.22$ ), followed by hospital admission without payment ( $3.19 \pm 1.31$ ). Specialist referral had the lowest mean score ( $1.42 \pm 1.13$ ).

**Table 6. Reported utilisation-related activity by item**

| Utilisation-related activity                    | Mean $\pm$ SD   |
|-------------------------------------------------|-----------------|
| Accessed healthcare under TISHIP                | $2.61 \pm 1.60$ |
| Specialist referral                             | $1.42 \pm 1.13$ |
| Collected prescribed drugs without payment      | $1.50 \pm 0.67$ |
| Hospital admission without payment              | $3.19 \pm 1.31$ |
| Complained to appropriate authority             | $2.10 \pm 0.91$ |
| Attended health seminar/enlightenment programme | $1.90 \pm 1.02$ |
| Accessed dental services                        | $2.85 \pm 1.37$ |
| Sought explanation about treatment              | $2.02 \pm 0.92$ |
| Read TISHIP information pamphlet                | $1.71 \pm 0.71$ |
| Laboratory investigation                        | $3.26 \pm 1.22$ |

The overall reported utilisation-related activity score was  $2.25 \pm 0.45$ . The mean scores were  $2.27 \pm 0.47$  at Ahmadu Bello University,  $2.31 \pm 0.42$  at Federal Polytechnic Kaduna and  $2.19 \pm 0.44$  at Federal College of Education, Zaria.

Because the variances differed across institutions (Levene's test,  $p = 0.012$ ), Welch's analysis of variance was used. There was no statistically significant difference in reported utilisation-related activity across the institutions (Welch  $F(2,171.2) = 1.13, p = 0.324$ ).

**Table 7. Overall reported utilisation-related activity score by institution**

| Institution                         | n   | Mean $\pm$ SD   |
|-------------------------------------|-----|-----------------|
| Ahmadu Bello University             | 203 | $2.27 \pm 0.47$ |
| Federal Polytechnic Kaduna          | 74  | $2.31 \pm 0.42$ |
| Federal College of Education, Zaria | 123 | $2.19 \pm 0.44$ |
| Overall                             | 400 | $2.25 \pm 0.45$ |

The utilisation-related activity score was interpreted as a frequency score and not as a percentage of students who utilised TISHIP or as a measure of programme coverage or uptake.

#### Overall PSQ-18 score

All 400 respondents included in the final analysis completed the 18 PSQ-18 items. The overall mean PSQ-18 score was  $3.14 \pm 0.28$  on the five-point scale (95% confidence interval [CI]:  $3.10\text{--}3.17$ ).

Institution-specific mean scores were  $3.12 \pm 0.29$  at Ahmadu Bello University,  $3.13 \pm 0.30$  at Federal Polytechnic Kaduna and  $3.16 \pm 0.25$  at Federal College of Education, Zaria.

**Table 8. Overall PSQ-18 score by institution**

| Institution                         | n   | Mean $\pm$ SD   | 95% CI              |
|-------------------------------------|-----|-----------------|---------------------|
| Ahmadu Bello University             | 203 | $3.12 \pm 0.29$ | $3.08\text{--}3.17$ |
| Federal Polytechnic Kaduna          | 74  | $3.13 \pm 0.30$ | $3.05\text{--}3.21$ |
| Federal College of Education, Zaria | 123 | $3.16 \pm 0.25$ | $3.11\text{--}3.21$ |
| Overall                             | 400 | $3.14 \pm 0.28$ | $3.10\text{--}3.17$ |

Levene's test indicated unequal variances across institutions for the

overall PSQ-18 score (Levene statistic = 3.65,  $p = 0.027$ ). Therefore, Welch's analysis of variance was used as the principal comparison. There was no statistically significant difference in overall PSQ-18 scores across the three institutions (Welch  $F(2,185.6) = 0.86$ ,  $p = 0.423$ ;  $\eta^2 = 0.004$ ).

The conventional one-way analysis of variance produced a similar conclusion ( $F(2,397) = 0.766$ ,  $p = 0.466$ ). The Kruskal-Wallis sensitivity analysis also showed no statistically significant difference ( $H = 1.84$ ,  $p = 0.399$ ).

### PSQ-18 domains

The seven PSQ-18 domain scores varied across institutions. Financial aspects had the lowest mean scores at all three institutions, whereas time spent with the doctor had the highest mean scores.

Because variance heterogeneity was detected for some domains, Welch's analysis of variance was used where appropriate.

**Table 9. PSQ-18 domain scores by institution**

| PSQ-18 domain             | ABU<br>Mean $\pm$ SD | Polytechnic<br>Mean $\pm$ SD | FCE<br>Mean $\pm$ SD | Welch F (df)    | P-value | $\eta^2$ |
|---------------------------|----------------------|------------------------------|----------------------|-----------------|---------|----------|
| General satisfaction      | 3.40 $\pm$ 0.87      | 3.26 $\pm$ 0.91              | 3.22 $\pm$ 0.89      | 1.94 (2, 176.1) | 0.147   | 0.009    |
| Technical quality         | 3.27 $\pm$ 0.36      | 3.18 $\pm$ 0.66              | 3.34 $\pm$ 0.55      | 2.51 (2, 166.7) | 0.084   | 0.017    |
| Interpersonal manner      | 2.90 $\pm$ 0.47      | 2.66 $\pm$ 0.95              | 2.83 $\pm$ 0.53      | 3.02 (2, 163.4) | 0.052   | 0.023    |
| Communication             | 2.84 $\pm$ 0.86      | 2.83 $\pm$ 0.95              | 2.96 $\pm$ 0.79      | 0.64 (2, 187.9) | 0.526   | 0.003    |
| Financial aspects         | 1.84 $\pm$ 0.50      | 2.20 $\pm$ 0.58              | 1.98 $\pm$ 0.49      | 7.04 (2, 174.9) | 0.001   | 0.045    |
| Time spent with doctor    | 3.77 $\pm$ 0.88      | 3.87 $\pm$ 0.80              | 3.71 $\pm$ 0.86      | 1.07 (2, 192.8) | 0.344   | 0.005    |
| Accessibility/convenience | 3.40 $\pm$ 0.73      | 3.58 $\pm$ 0.68              | 3.46 $\pm$ 0.78      | 3.28 (2, 186.4) | 0.040   | 0.017    |

Statistically significant institutional differences were detected for financial aspects (Welch  $F(2,174.9) = 7.04$ ,  $p = 0.001$ ;  $\eta^2 = 0.045$ ) and accessibility/convenience (Welch  $F(2,186.4) = 3.28$ ,  $p = 0.040$ ;  $\eta^2 = 0.017$ ). The differences in technical quality and interpersonal manner observed with conventional analysis were attenuated when unequal variances were taken into account and were not statistically significant in the Welch analyses.

The largest effect observed was for financial aspects ( $\eta^2 = 0.045$ ), representing a small effect. The effect sizes for accessibility/convenience, technical quality and interpersonal manner were also small.

### Association between awareness and reported utilisation-related activity

There was a statistically significant inverse association between awareness score and reported utilisation-related activity score (Pearson correlation coefficient,  $r = -0.335$ , 95% CI:  $-0.419$  to  $-0.245$ ;  $p < 0.001$ ;  $n = 400$ ). Respondents with higher awareness scores tended to report lower frequencies of the assessed utilisation-related activities.

### Association between reported utilisation-related activity and PSQ-18 score

There was a statistically significant inverse association between reported utilisation-related activity and overall PSQ-18 score ( $r = -0.306$ , 95% CI:  $-0.392$  to  $-0.214$ ;  $p < 0.001$ ;  $n = 400$ ). Respondents reporting more frequent utilisation-related activities tended to report lower PSQ-18 scores.

These correlations indicate statistical associations and do not establish temporal direction or causality.

### Adjusted analysis of institutional differences in PSQ-18 score

A multivariable linear regression model was fitted to examine whether the observed institutional differences in overall PSQ-18 score persisted after adjustment for sex, age group, accommodation and marital status. The model explained 27.4% of the variance in PSQ-18 score, with an adjusted  $R^2$  of 0.253.

Compared with Ahmadu Bello University, the adjusted difference in

PSQ-18 score was  $-0.037$  (95% CI:  $-0.106$  to  $0.032$ ;  $p = 0.291$ ) for Federal College of Education, Zaria and  $-0.054$  (95% CI:  $-0.128$  to  $0.021$ ;  $p = 0.156$ ) for Federal Polytechnic Kaduna.

**Table 10. Multivariable regression of overall PSQ-18 score**

| Variable                          | Adjusted B | 95% CI           | p-value |
|-----------------------------------|------------|------------------|---------|
| <b>Institution</b>                |            |                  |         |
| FCE, Zaria vs ABU                 | -0.037     | -0.106 to 0.032  | 0.291   |
| Federal Polytechnic Kaduna vs ABU | -0.054     | -0.128 to 0.021  | 0.156   |
| <b>Sex</b>                        |            |                  |         |
| Male vs female                    | 0.262      | 0.203 to 0.321   | <0.001  |
| <b>Age group</b>                  |            |                  |         |
| 21–25 vs 16–20 years              | 0.070      | 0.002 to 0.138   | 0.043   |
| 26–30 vs 16–20 years              | 0.063      | -0.018 to 0.144  | 0.129   |
| $\geq 31$ vs 16–20 years          | -0.079     | -0.173 to 0.016  | 0.103   |
| <16 vs 16–20 years                | -0.020     | -0.169 to 0.129  | 0.791   |
| On-campus vs off-campus           | 0.039      | -0.026 to 0.105  | 0.240   |
| <b>Marital status</b>             |            |                  |         |
| Married vs single                 | -0.017     | -0.078 to 0.044  | 0.579   |
| Divorced vs single                | -0.380     | -0.498 to -0.262 | <0.001  |
| Widowed vs single                 | -0.308     | -0.475 to -0.141 | <0.001  |

Model summary:  $R^2 = 0.274$ ; adjusted  $R^2 = 0.253$ . Reference categories: ABU, female sex, age 16–20 years, off-campus accommodation and single marital status. Abbreviations: ABU, Ahmadu Bello University; FCE, Federal College of Education; CI, confidence interval.

After adjustment, there was no statistically significant difference in overall PSQ-18 score between either FCE, Zaria or Federal Polytechnic Kaduna and ABU. Male sex and age 21–25 years were associated with higher PSQ-18 scores, whereas divorced and widowed marital status were associated with lower scores compared with their respective reference categories.

## DISCUSSION

This study assessed awareness, reported utilisation-related activity and perceptions of healthcare services among students in three federal tertiary institutions in Kaduna State. The overall PSQ-18 score was  $3.14 \pm 0.28$  on a five-point scale. The analysis did not detect a statistically significant difference in the overall score across Ahmadu Bello University, Federal Polytechnic Kaduna and Federal College of Education, Zaria. However, differences were detected in the financial aspects and accessibility/convenience domains. The findings therefore suggest broadly similar overall perceptions across the participating institutions, while some specific dimensions of healthcare experience varied.

Only 33.3% of respondents reported awareness of TISHIP. This finding is consistent with evidence from Nigerian tertiary institutions showing that awareness and understanding of the programme remain incomplete. Anetoh et al. identified important gaps between awareness and actual benefit from TISHIP among students of Nnamdi Azikiwe University, with concerns relating to medicine availability, waiting time and provider attitudes.<sup>5</sup> Aniwada et al. similarly reported limited awareness and utilisation among undergraduate students in Enugu State.<sup>6</sup> More recent evidence from Southwestern Nigeria also demonstrated limited knowledge of TISHIP among tertiary institution students.<sup>7</sup>

Awareness of individual benefit packages varied substantially. More than 90% of respondents recognised health promotion and prevention services, consultation, treatment and prescribed drugs, dental care, and antenatal and delivery care as benefits, whereas very few recognised free hospital admission or blood transfusion. This pattern suggests that students may recognise selected healthcare services without having a comprehensive understanding of the programme and its benefit package. Communication about TISHIP should therefore extend beyond programme awareness to practical information about eligible services, referral procedures and access arrangements.

The overall reported utilisation-related activity score was  $2.25 \pm 0.45$

on the five-point frequency scale. This score should not be interpreted as 45% utilisation or as the proportion of students covered by TISHIP. It represents the average frequency with which respondents reported engaging in the 10 assessed activities. Laboratory investigations and hospital admission had the highest scores, whereas specialist referral, obtaining medicines without payment, reading information pamphlets and participation in health seminars had lower scores.

The distinction between reported utilisation-related activity and confirmed TISHIP utilisation is important. The questionnaire did not establish individual TISHIP enrolment or whether a respondent's healthcare encounter was specifically funded through TISHIP. Consequently, the present findings cannot provide a direct estimate of programme uptake or coverage. Previous Nigerian studies have used different definitions and denominators for utilisation, which further limits direct numerical comparison.<sup>6</sup>

The overall PSQ-18 score of  $3.14 \pm 0.28$  indicates that respondents' perceptions were distributed around the midpoint of the five-point response scale. The PSQ-18 is multidimensional and assesses seven domains of healthcare experience.<sup>12,13</sup> The present study therefore considered both the overall score and individual domains. No predefined threshold was used to categorise respondents as satisfied or dissatisfied, because such a threshold had not been established for this study population. This conservative approach is consistent with the broader measurement literature, which indicates that satisfaction scores are influenced by respondent expectations, prior experiences and the context in which care is delivered.<sup>11,18</sup>

There was no statistically significant institutional difference in the overall PSQ-18 score. The institution-specific means were closely grouped, ranging from 3.12 at Ahmadu Bello University to 3.16 at Federal College of Education, Zaria. The small effect size further indicates that the observed between-institution variation accounted for little of the overall variation in the PSQ-18 score. The adjusted regression analysis also showed no statistically significant institutional difference after adjustment for sex, age, accommodation and marital status.

The absence of a statistically significant difference should not be interpreted as evidence that the institutions are equivalent. Rather, the study did not detect a statistically significant difference in overall PSQ-18 scores between the participating institutions. The institutions were purposively selected and had unequal analytical response proportions, particularly the lower participation from Federal Polytechnic Kaduna, which limits the extent to which the findings can be generalised.

The domain-level findings provide additional information. Financial aspects showed the largest institutional difference and the largest effect size among the PSQ-18 domains. Mean financial-aspect scores were lowest at Ahmadu Bello University and highest at Federal Polytechnic Kaduna. However, the study did not directly measure the specific sources of financial concerns, such as medicine availability, excluded services, additional payments, referral costs or other out-of-pocket expenditures. The finding should therefore be regarded as an indication that the financial dimension warrants further investigation rather than evidence of a specific underlying cause.

Accessibility and convenience also differed across institutions, although the effect size was small. Accessibility encompasses several aspects of healthcare access, but the study did not collect sufficiently detailed information on physical distance, appointment availability, waiting time or referral processes to identify the mechanism responsible for the observed difference. An earlier study among students at the Ahmadu Bello University sick bay identified waiting time as an important component of satisfaction, although differences in instruments and study populations prevent direct numerical comparison.<sup>8</sup>

Technical quality and interpersonal manner did not retain statistical significance when unequal variances were accounted for using Welch's analysis. This illustrates the importance of considering variance assumptions when comparing questionnaire-derived scores across groups. The findings should therefore not be interpreted as demonstrating institutional differences in objective clinical quality or provider competence. They represent respondents' perceptions of healthcare services. Previous analyses of population surveys have similarly shown that satisfaction ratings are associated with, but distinct from, reports of specific care experiences, and that they reflect expectations as well as the processes of care.<sup>19</sup>

The inverse association between reported utilisation-related activity and PSQ-18 score indicates that respondents reporting more frequent engagement with the assessed activities tended to report lower satisfaction scores. One possible explanation is that students with more frequent healthcare encounters have greater opportunity to experience aspects of care that they perceive negatively. Another possibility is that students with unresolved health needs may seek care more frequently. These explanations are hypotheses rather than findings established by the present study. The cross-sectional design does not establish temporal direction or causality.

Similarly, awareness was inversely associated with reported utilisation-related activity. This finding does not support a simple assumption that greater awareness necessarily produces more frequent utilisation. Differences in healthcare needs, perceived relevance of individual benefits, accessibility and the way the two constructs were measured may contribute to the observed association. Because the utilisation measure was study-specific and did not directly establish TISHIP enrolment or confirmed programme use, the finding should be interpreted cautiously.

The findings should be considered alongside previous Nigerian evidence. Studies from Nnamdi Azikiwe University and Enugu State identified gaps in TISHIP awareness, implementation and utilisation, while recent evidence from Southwestern Nigeria demonstrated continued limitations in student knowledge of the programme.<sup>5-7</sup> Qualitative evidence from Jos has also provided insight into stakeholder experiences of TISHIP implementation in northern Nigeria.<sup>9</sup> Differences in populations, institutional arrangements, measurement instruments and outcome definitions mean that numerical estimates cannot be directly compared across these studies.

The findings have several programme implications. First, the low level of reported awareness supports continued communication about TISHIP and its benefit package. Communication should provide practical information on eligible services, referral procedures and mechanisms for obtaining assistance. Second, monitoring of student experience should examine specific dimensions of healthcare delivery rather than relying solely on a global satisfaction score. Financial and accessibility-related dimensions warrant particular attention. Third, participating institutions could routinely collect standardised student feedback to identify changes in specific aspects of service delivery.

### Limitations

This study has several limitations. First, its cross-sectional design limits causal inference. Second, the participating institutions were purposively selected, limiting generalisability to other tertiary institutions in Kaduna State and Nigeria. Third, the study relied on self-reported information and may therefore have been affected by recall and social desirability biases.

Fourth, participation differed substantially across institutions, particularly at Federal Polytechnic Kaduna, where the analytical response proportion was lower than at the other institutions. This may have introduced non-response or compositional bias. Fifth, the multistage sampling approach may have introduced clustering at

academic-unit level, and no design effect or cluster-adjusted standard errors were applied. Sixth, residual confounding cannot be excluded despite adjustment for selected socio-demographic characteristics.

Most importantly, the questionnaire did not contain a separate measure confirming individual TISHIP enrolment or identifying respondents who specifically accessed TISHIP-funded healthcare services during the recall period. Although all respondents completed the PSQ-18, the resulting scores therefore cannot be attributed exclusively to TISHIP-funded encounters. Similarly, the utilisation-related activity score should not be interpreted as a direct measure of TISHIP uptake or coverage.

The PSQ-18 was administered as a structured multidimensional measure, but the study did not independently establish a locally validated threshold for categorising respondents as satisfied or dissatisfied. The overall score was therefore retained as a continuous descriptive measure. Future studies should explicitly establish TISHIP enrolment and service-use status and should define a healthcare encounter recall period for respondents who are being assessed as confirmed service users.

## CONCLUSION

The study found low reported awareness of TISHIP among students in the three participating federal tertiary institutions, while reported utilisation-related activity was limited. Overall perceptions of healthcare services, measured using the PSQ-18, did not differ statistically across the three institutions after consideration of unequal variances and adjustment for selected participant characteristics.

Differences were observed in the financial aspects and accessibility/convenience domains, although the corresponding effect sizes were small. The findings indicate that assessment of TISHIP should extend beyond programme awareness and reported utilisation-related activity to include specific dimensions of students' perceptions of healthcare delivery.

Because individual TISHIP enrolment and TISHIP-specific service use were not separately established, the findings should be interpreted as students' perceptions of healthcare services within the TISHIP context rather than as a direct measure of satisfaction among confirmed TISHIP service users.

## RECOMMENDATIONS

1. Participating institutions and programme managers should strengthen communication on TISHIP eligibility, benefit packages, referral procedures and mechanisms for accessing care.
2. Routine student feedback should include specific domains of healthcare experience, particularly financial aspects and accessibility/convenience, rather than relying solely on an overall satisfaction measure.
3. TISHIP monitoring should incorporate direct measures of individual enrolment, healthcare utilisation, out-of-pocket expenditure and service-specific encounters.
4. Future studies should use probability-based sampling where feasible, account for clustering at academic-unit level and address unequal participation across institutions.
5. Future comparative studies should recruit confirmed TISHIP enrollees or documented service users and apply a clearly defined healthcare encounter recall period.
6. Longitudinal or repeated cross-sectional studies should be considered to assess whether changes in TISHIP implementation are accompanied by changes in

awareness, utilisation and perceptions of healthcare services.

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