

Effect of revenue leakages on revenue generation of Nigerian tertiary hospitals in north-east Nigeria

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Abstract

Purpose: This paper examines the effect of revenue leakages on revenue generation of Nigerian tertiary hospitals in Northeast Nigeria.

Methodology: The study employed quantitative research approach using primary data. The data was collected via questionnaire. A total of 590 revenue staff from 13 federal tertiary hospitals in Northeast Nigeria made up the population of the study. Krejcie and Morgan formula was used to arrive at a sample size of 234. Partial Least Square-Structural Equation Model (PLS-SEM) path modeling was used to assess both the measurements and structural model evaluation.

Results and conclusion: This study found that staff attitude, accountability, supervision, and information technology positively affect revenue generation in Nigerian tertiary hospitals, while perceived corruption negatively affects it, connivance was found to be insignificantly related to the revenue generation among tertiary hospitals in Northeast Nigeria. Therefore, this study concludes that, revenue leakages have significant impact on the revenue generation of tertiary hospitals in Northeast Nigeria.

Implication of findings: Accordingly, Hence, the study recommends that, the federal government put more effort to address leakages in Nigerian tertiary hospitals through reforms, more openness and fortified institutional frameworks. The findings have implication for researchers, policy makers and management of tertiary hospitals in Nigeria.

Keywords: Revenue leakages, Generation, Federal tertiary hospitals, Northeast Nigeria.

1. Introduction

Revenue generation drive is a phenomenal task for government at all levels and in all sectors of the economy for economic and national development (Odewale & Ololade, 2022). Governments from all parts of the world have to generate revenue for their citizens through various sources to provide basic services which are mainly collective, quasi-collective services and utilities for the well-being of their citizenry (Elekwe & Okechukwu, 2014). In Nigeria, the revenue generation is asymmetrical and dominated by oil revenue (Obinna et al., 2019). Therefore, any slide changes in oil revenue will have effect on the revenue accrued to the federal government. A good example is the decline in oil prices in recent years which has led to a decrease in oil revenue due to the government. According to the Federation Account Allocation Committee (FAAC) report of February 2022, Petroleum Profit Tax (PPT) and oil and gas royalties decreased significantly while VAT, Import and Excise Duties decreased marginally (Ugoeze & Chibueze, 2022). Based on the foregoing, it is clear that oil revenue cannot sufficiently support the developmental objectives of the country due to the serious decline in the prices of oil in recent years that has led to oil price volatility and a decrease in overall revenue generated by the government (Amahalu et al., 2019).

In a situation where a government fails to adequately finance public infrastructure, alternative funding sources, including internal revenue generation, become necessary. Virtually all the Ministries, Departments and Agencies (MDAs) of government rely heavily on the federal government allocation to meet both the recurrent and capital expenditures in every financial year (Adegbite & Azeez, 2021). It is worthy of note that, 80 percent budget of the Nigerian public hospitals are coming from federal

government allocations (Folorunsho, 2020). However, a sharp drop in the oil revenue of the country shifted financial responsibilities on different MDAs to source funds internally to finance the increasing demand for current domestic expenditure. Hence, the reality of alternative funding apart from the central allocation became imperative in all public entities for sustainable growth (Odewale & Ololade, 2022). Also, sufficient internal financial challenges equally subsisting among the institutions which the federal authority could not accommodate also necessitate the need to generate more funds internally (Odewale & Ololade, 2022).

In the course of harnessing internally generated funds, accountability and transparency have always been a major cause of concern for many years as a result of misstatement, fraud and corruption in Nigerian public institutions (Olugbusi & Ojo, 2021). Therefore, lack of accountability and transparency in the public sector generates the potential for corruption with negative consequences on service delivery and consequently on the citizen of the nation (Chukwunwike et al., 2021). However, some of the federal tertiary hospitals in Nigeria are taking steps to track and block leakages in their day-to-day cash receipts and collections by introducing technology such as electronic collection systems into their respective accounting information systems (Kabir, 2017). Despite the effort, there is a need to introduce an efficient process that will enhance the procedure of controlling cash receipts and guarding against cash mishandling in federal tertiary hospitals (Kabir, 2017). In a bid to improve financial control practices in the Nigerian tertiary hospitals, the federal government introduced the Integrated Payroll and Personnel Information System (IPPIS) in federal-owned institutions (Oloaye et al., 2021). The IPPIS creates a centralized database system for Nigerian public service with a single and accurate source of employee information that provides integration with other business applications (Oloaye et al., 2021). Despite the efforts by the government, unauthorized financial transactions continue to flow in various public hospitals which continue to worsen the dwindling economic situation in the country (Ugoeze & Chibueze, 2022).

Based on the foregoing, there is a desirable need for a study to find out the inhibiting factors that deteriorate the revenue generation of federal tertiary hospitals despite the citizens paying immensely to access the medical services in the public tertiary hospitals. Among other factors outlined by the previous studies, revenue leakage is the main reason behind the dwindling level of revenue generated by Nigerian tertiary hospitals (Folorunsho, 2020). Therefore, this study is motivated to investigate the impact of revenue leakages on revenue generation of federal tertiary hospitals in Nigeria. Based on the prior literature, it is evident that many researchers have attempted to address the factors affecting revenue generation in a different global context as well as under diverse cultures and environments (Adegbite & Adegbayi, 2022; Baada et al., 2022; Ganyam et al., 2019; Obinna et al., 2019; Eja et al., 2018; Kabir, 2017; Elekwa & Okechukwu, 2014).

However, there are limited studies that considered examining the effects of diverse determinants of revenue generation, especially in developing countries like Nigeria. To the best of the researcher's knowledge, no prior study has considered the influence of staff attitude and staff connivance in relation to revenue generation despite the researcher's observation that staff attitude and connivance are among the trending means through which revenue leakage flow in Nigerian public hospitals. In view of the above, this study filled the gap by investigating the effect of staff attitude, accountability, perceived corruption, supervision, connivance and information technology on the revenue generation of public tertiary hospitals in North-east Nigeria.

2. Literature review

Concept of revenue generation

Revenue generation refers to income, receipt, or inflow derived by a financial entity through legal operation during business or in respect of the disposal of asset in use or otherwise (Odewale & Ololade, 2022). Revenue generation is also the way through which organizations raise funds for the purposes of meeting both capital and recurrent expenditures (Osho et al., 2019). It is a medium through which an institution or entity markets and sells its goods or services to produce income while creating value for its customers (Baada et al., 2022). Government generates revenue from different sources such as taxes, borrowings, fines, fees, donations. The revenue sources may include taxes levied on income and wealth of individuals or corporations, tax on exports and imports products, income from government-owned corporations as well as capital receipts in the form of external loans and debts from international financial institutions (Ganyam et al., 2019). Therefore, it is a well-established fact that tax revenue constitutes a major source of income for government in most developed and developing countries (Eja et al., 2018). Government also generates revenue from grant, privatization, and crude oil disposal. These revenues can be derived from foreign aid, royalties from natural resources. Besides, Nigerian federally collected revenue is divided into oil and non-oil revenue. While oil revenue covers all revenue generated from oil and gas activities in the country, non-oil revenue is revenue earned from sources other than oil and gas activities. Unlike other countries within and outside Africa who segment their revenues into tax and non-tax revenue, Nigeria preferred to segment it revenue into oil and non-oil, as oil is the major revenue driver of the economy (Amahalu et al., 2019; Ganyam et al., 2019).

Concept of revenue leakages

Revenue leakages refer to losses of revenue through multitude of loopholes that riddle the financial system (Amahalu et al., 2019). Revenue leakages have been a universal phenomenon that drains the profit margin of services and transactions in either public or private sector (Amahalu et al., 2019). However, public sector revenue leakage is defined as a deliberate and intentional embezzlement of government's fund, inflation of contracts; non availability to produce payment voucher for monies paid out (Elekwa & Okechukwu, 2014). Revenue leakage can also include non-retirement of impress advances collected by government officials in their agency or in other agencies. It also includes institutionalization of various forms of corrupt and fraudulent practices in governmental agencies. Different factors are responsible for the revenue leakages in developing economies including Nigeria. The practice is more prevalent in developing countries compared to developed countries. The reason for the prevalence can be attributed to development process which most developed countries have been able to overcome overtime (Adegbite & Adegbayi, 2022).

Besides, revenue leakage occurs when income is taken out through taxes, savings and imports without employer's authorization (Sokoh, 2018). Leakage can also occur due to incorrect pricing, operational inefficiencies, missing transactions, uncollected revenue among others (Adegbite & Adegbayi 2022). Revenue leakage can also happen in various stages of the customer relationship life cycle, such as prospecting, on-boarding, transaction processing, billing and recovery, monitoring and service closure. In any case, there can be cracks that give rise to revenue leakage. This includes nonretirement of impress advances collected by some hospital staff on behalf of the hospital, institutionalization of various form of corrupt and fraudulent practices which characterize the financial situation in many hospitals in Nigeria.

Staff attitude and revenue generation

Staff attitude refers to the mental and emotional disposition of a person toward a certain object (Abun et al., 2021). It may be a favorable or unfavorable evaluative reaction toward something or someone. This proposition is supported by Theory of Planned Behavior (TPB) as the theory affirms that attitude affects the behavior of a person to act in a certain way. This is because; people would behave toward a certain work or job favorably or unfavorably depending on their feelings toward the work (Ajzen, 1993). Empirically, many studies were conducted on the relationship between staff attitude and revenue generation. A preponderant of these studies reported a significant positive relationship between staff attitude and revenue generation (Hettiararchchi & Jayarathna, 2014; Khan et al., 2014; Abba, 2019; Ogilo, 2020). For example, Abun et al. (2021) found a significant positive relation between attitude of staff toward work and work performance. In the same manner, Ogilo et al. (2020) found a positive association between employee attitude and organizational performance in Rivers state Nigeria.

In the same vein, Khan et al. (2014) found employees' attitudes having positive and significant influence on employee performance. The study was carried out to examine the effect of employees' attitude on employees' performance. Also, Abba (2019) concludes that staff work related attitude has positive and significant effect on employee job performance in the Turkish aviation sector. Moreover, Sokoh (2018) equality found a significant positive relation between the two variables. Soale and Akudugu (2021) found a positive relation between staff attitude and job performance of senior staff of University of Cape Coast, Ghana. A similar study conducted by Onwubiko (2019) also revealed a significant positive association between library staff attitude and their job performance in Alex Ekwueme federal University, Ebonyi state, Nigeria. In the same vein, Unwana and Men (2022) found a significant positive effect of staff attitude on staff academic profile as factors influencing the use of two special libraries in Abuja. Besides, Hettiararchchi and Jayarathna (2014) found a significant positive effect of employee work related attitudes on employee job performance with reference to tertiary and vocational education in Sri-Lanka.

On contrary, Menezes and Kelliher (2017) found a significant negative association between attitude and individual performance in the UK. At the extreme, Aboelmegeed and Gebba (2013) found an insignificant relationship between attitude and technological ease of use on revenue generation in the UAE. In line with the above discussions, it is expected that staff attitude would have significant positive influence on revenue generation of tertiary hospitals in Nigeria. This is because; the work performance of revenue staff is expected to improve by their attitude. This is visible because, employees are recruited in tertiary hospitals with a favorable expectation to improve the efficiency of the hospitals in generating revenue. Therefore, based on the above presumptions, the hypothesis below is formulated:

H1: Staff attitude is positive and significantly related to revenue generation of tertiary hospitals in Nigeria.

Accountability and revenue generation

Accountability refers to a process in which a staff has a responsibility to report details of responsibility assign to him to another party who has the right to pass judgment on those actions (Chukwunwike et al., 2021). Accountability had been used in much research to determine its impact on individual and organizational revenue generation. In the context of the current research, the construct is expected to improve the revenue generation of tertiary hospitals. This is in line with the view of control theory which affirms that, a good centralized and structured administration (as outlined by centralized control)

required a proper feedback or report on the assignment delegated by the superior to the subordinate. However, several prior studies had also affirmed the influence of accountability on individual as well as organizational generation (Oloaye et al., 2021; Nwokike et al., 2021; Ani, 2022). Among others, a study conducted in United States by Han and Hong (2019) found a significant positive association between levels of organizational revenue performance and accountability. In Malaysia, Cheuk et al. (2020) found a positive association between accountability and personal revenue generation at mediation level. Also, Ani (2022) found a significant positive relationship between financial accountability on the generated revenue administration of area councils in Abuja.

Besides, Augustine et al. (2019) found government accountability to have significant positive influence on revenue generation via voluntary tax compliance. In the same vein, Olugbusi and Ojo (2021) affirmed a significant positive association between the variables when the study critically examined the concepts of accountability and transparency among internal revenue service in both Lagos and Ogun States. Also, Nwokike et al. (2021) investigated the relationship between accountability and revenue generation in the local government system in Anambra state. The study found the existence of significant positive relationship between the variables in the study. Contrarily, Chukwunwike et al. (2021) obtained no significant relationship between accountability and tax revenue generation in Nigeria. Similar result was obtained by Chukwunwike et al. (2021) which found an insignificant relationship between accountability and revenue generation.

In contrast, Halim (2019) obtained an inverse relationship between accountability and the revenue generation of public sector organization. Based on the foregoing, accountability is expected to have a significant positive impact on revenue generation of tertiary hospitals in Nigeria. This is because, in order to achieve an improved revenue generation in the tertiary hospitals, accountability must be strengthened. A system must be put in place to ensure that employees did their assigned task to the best of their ability and consequently report back to their superior. Therefore, based on the above presumptions, the following hypothesis is formulated:

H2: Accountability is positive and significantly related to revenue generation of tertiary hospitals in Nigeria.

Perceived corruption and revenue generation

Perceived corruption refers to a situation where an official, as a result of undue bribe or promise in any spheres, abuses his or other person's office by putting aside due process and compromising fairness and equity in distribution of scarce resources within his jurisdiction or authority (Nwokike et al., 2021). Several studies were conducted on the relationship between corruption and revenue generation (Augustine & Enyi, 2020; Abun et al., 2021; Yaru and Raji, 2022). Among others, Mohamed et al. (2022) affirmed that corruption and government effectiveness was negatively related to revenue generation in Mogadishu, Somalia. Similar results were obtained by Obaid and Udin (2020) which also found a significant negative association between corruption and tax revenue generation (proxy by tax noncompliance). In the same manner, Nyabunze and Sravhundu (2020) found a significant negative relationship between corruption and revenue generation in Zimbabwe. Also, a study conducted on multiple African countries by Yaru and Raji (2022) confirmed the existence of a significant negative association between corruption and the revenue generation. Alternatively, positive relationship was found between corruption and revenue generation by Arif and Rawat (2018). Besides, Alkhatib and

Maria (2021) found insignificant relationship between corruption and tax revenue generation in Palestine's SMEs using the index of tax evasion.

From the theoretical point of view, the TPB presumes that corruption will have a negative influence on revenue generation. This is because corruption start by intention of an employee to behave in a negative way, which makes the TPB relevant to this construct as the resource is expected to be taken from the entity's earnings against the wish of the owner, hence reducing his income. Therefore, corruption is expected to have inverse relation with revenue generation. Similarly, in the case of Nigerian tertiary hospitals, corruption among revenue staff in the form of bribe, leakage and maladministration among others is expected to reduce the revenue generated by the hospitals which is to be remitted to the government for internal maintenance. This assertion is in line with the view of Yaru and Raji (2022) which believes that corruption among officials is expected to have negative association with revenue generated by the government through the tax authorities. Based on the foregoing, it is expected that corruption would have a significant negative influence on revenue generation of tertiary hospitals in Nigeria. This is because; corruption by the revenue officials in the tertiary hospitals is taking from the generated revenue of these hospitals. Therefore, based on the above presumptions, the hypothesis is formulated as follows:

H3: Perceived corruption is positive and significantly related to revenue generation of tertiary hospitals in Nigeria.

Supervision and revenue generation

Supervision suggests a close observation and detailed face-to-face interaction between the superior and the subordinate staff with the aim of binding the two in an intimate professional relationship for individual and organizational improvement (Hannang et al., 2020). Several studies were conducted on the relationship between supervision and employee as well as organizational revenue generation. Most of the existing studies found a significant positive relationship between the two variables (Mustapha & Edegware, 2017; Hannang et al., 2020; Ldama, 2021; Nwosu et al., 2021). Control theory has also affirmed the significant influence of supervision on revenue generation through improved revenue and employee performance. The present study reviewed individual and organizational revenue performance because there was paucity in the body of literature to investigate the direct relationship between supervision and revenue generation, which is why the current research is set out to fill the gap.

Among others, Nwosu et al. (2021) conducted a study to determine how structured supervision of work influences attitude and promotes job performance in public universities. Accordingly, the study found a significant positive relationship between the two constructs. A similar study undertaken by Wiyono et al. (2020) revealed the existence of a positive relationship between the principal supervision and the quality of organizational management in school education in Indonesia. Also, Mustapha and Edegware (2017) examined the relationship between managerial supervision and productivity on the Edo state board of internal revenue. The study found a significant positive relationship existed between the two variables. Rowe et al. (2022) concludes that supervision has integral role to play in optimizing its effects on healthcare providers' practices in low and middle-income countries. Besides, Lee and Kusumah (2020) found a significant positive relationship between the two variables. Also, Koske and Atambo (2018) examined the impact of supervision on employee performance in Kenya Tea Packers Company. Positive association was also found between the two variables in the study.

On the contrary, Ldama (2021) found a negative relationship between supervision and organizational efficiency when the study examined the influence of supervision on organizational efficiency in Nigerian banking sector. A similar finding was observed by Hussain et al. (2022) which found a negative relationship supervision and employee creativity in Pakistan. Based on the foregoing, it is expected that supervision would have a significant positive impact on revenue generation of tertiary hospitals in Nigeria. This is because, structured supervision has monitoring policies that allow the superiors revenue staff to monitor the activities of the junior ones for efficiency and improvement. This would effectively help the hospitals to attain its targeted revenue efficiently. Therefore, based on the above presumptions, the following hypothesis is formulated:

H4: Supervision is positive and significantly related to revenue generation of tertiary hospitals in Nigeria.

Connivance and revenue generation

Connivance connotes an agreement indirectly given, that something unlawful shall be done on someone's behalf (Hollinger & Davis, 2004). Therefore, connivance among revenue staff to perpetrate an unlawful act is expected to reduce the revenue generation of hospitals. This can be justified by the proposition of classical theory that humans are believed to be inherently rational and self-indulgent (Hollinger and Davis, 2004). Therefore, staff in organization are likely to collude with one another in order to make decisions that will have personal benefit to them and also provide them with greatest amount of pleasure even if it means violating the law. Hence, for the revenue staff in the hospitals, they can collude with one other in order to have a low risk of detection. Besides, one of the major contributions of the current study is that, to the best of the researcher's knowledge, this is the first study to examine the relationship between connivance and revenue generation. As a result of paucity in literature to gauge the relationship, there was no study that directly examines the relationship between the two variables.

However, the researcher was able to review some studies on collaboration or teamwork, which are the positive aspect of connivance. The results of most of the reviewed studies (such as Phina et al. 2018; Ali and Reuben, 2019; Wanyeki et al., 2019; Askari et al., 2020; Obiekwe et al., 2021; Wipulanusat et al., 2021) revealed significant positive relations between the constructs. However, the relationship is expected to be negative because connivance is not for good intention as the reviewed constructs. Moreover, considering the proposition of the classical theory on human beings been rational and self-indulgent beings, it was expected that connivance would have a negative association with revenue generation. Given the above scenario, the following hypothesis is formulated as the expected finding of this study.

H5: Connivance is positive and significantly related to revenue generation of tertiary hospitals in Nigeria.

Information technology and revenue generation

Information Technology in this context refers to online payment systems that ensure transactions or payment for goods and services is affected through an electronic medium, without the use of cheques or cash (Adegbe et al., 2022). Due to the diverse nature of technology, the construct had been adopted by many prior studies to determine its influence on efficiency and performance improvement of varied organizations (Adegbe et al., 2022; Sani et al., 2022; Adegbite & Adgbayi, 2022). Besides, a quite number prior of studies had affirmed the existence of a relationship between technology and revenue generation

performance. Most of the existing studies found a significant positive relationship between technology and revenue generation. For example, Kaunainfathima and Moyeenudin (2019) found a significant positive association between technology and revenue generation among hotels in India. A similar study conducted by Adegbe and Akinyemi (2020) shows that electronic means of revenue generation have a significant positive relationship with revenue generation in Lagos state. In the same vein, Otekunrin et al. (2021) found that, using technology in revenue generation process has a significant positive influence on volume of generated revenue and also reduce the level of tax evasion in Nigeria. Adegbe et al. (2022) also confirm the existence of a significant positive relationship between technology adoption and revenue generation in Nigeria. Moreover, Nchuchuwe and Ojo (2017) examined the importance of technology devices utilization on generating revenue and block revenue leakages in Lagos state. The study also affirmed the existence of a significant positive relationship between the two variables. Also, Joseph (2018) found a significant positive relationship between technology usage and revenue generation in Nigeria using time-series data. On contrary, Ofurum et al. (2018) obtained a negative relationship between technology adoption and tax revenue. Besides, Lee and Choi (2016) found an insignificant association between technology expenditure and the revenue generation of hospitals in Texas, United States. In line with the above discussions, the present study expects a significant positive relationship between technology and revenue generation among tertiary hospitals in Nigeria. Accordingly, the following hypothesis is formulated:

H6: Information technology is positive and significantly related to revenue generation of tertiary hospitals in Nigeria.

Research framework

A research framework is the diagrammatic blueprint for the entire research and therefore serves as a guide for building and supporting the research. However, the conceptual framework of this research work is developed to test the relationship between the dependent variable (revenue generation) and the independent variables; staff attitude, accountability, perceived corruption, supervision, connivance and information technology. The test of the relationship between dependent and independent variables was theorized from the previous findings that revealed the significant relationship that exists between the selected independent variables and revenue generation of tertiary hospitals. The research framework is as presented in Figure 1 below:

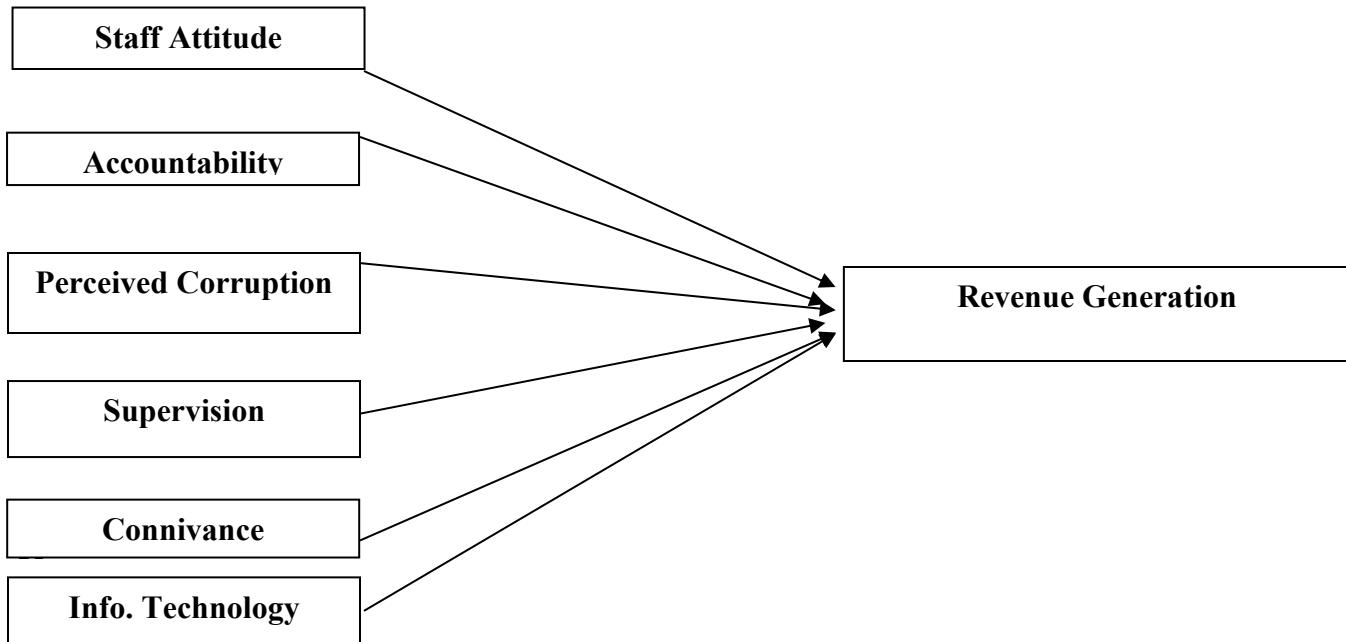


Figure 1: Research Framework.

3. Methodology

Research design is described as a blueprint showing how a researcher plans to gather and analyze the data, to interpret the findings and to provide solutions to the research problem under investigation (Sekaran & Bougie, 2013). However, the design for this study is survey research design using questionnaire. The study focuses on the 14 Federal Hospitals in Northeastern Nigeria which are categorized into three different group; Federal University Teaching Hospitals (FUTH), Federal Medical Centers (FMC) and Federal Specialist Hospitals (FSH). The targeted respondents are employees whose duties relate to revenue generation activities including cashiers, accountants, finance officers and other related officials in the federal hospitals of Nigeria. Accordingly, the population of this study is approximately 590 revenue generation employees. To determine the appropriate sample size for this study, Krejcie and Morgan table for determining sample size was employed. Based on the Krejcie and Morgan table, the approximate minimum sample size required for a population of 590 is 254 respondents. Therefore, the sample size of this study is 254 respondents. Besides, the sample size for the study was increased by 10% making the total sample for the study to be 279 so as to reduce sampling error and handle the unavoidable low response rate during data collection (Hair et al., 2016).

This study employed cluster-sampling techniques in arriving at the sample. Cluster sampling was selected as mostly used when samples are widely dispersed across geographical areas. The Northeast region was selected, which comprised six states in the region namely: Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe states. To this effect, each state represents a cluster for this study. The reason for selection of Northeast zone is that the region faces specific health challenges including those related to conflict, displacement and limited access to healthcare, making research essential to understand the needs of the population and develop target interventions. This study employed a quantitative research approach where primary data was collected through administering the survey instrument (questionnaire) to the target respondents. For validity, reliability and to test and analyze the proposed hypotheses, the study used the inferential statistical technique, which is Partial Least Square-Structural

Equation Modelling (PLS-SEM). Researchers are using this analytical method in statistical path modeling analysis to check the complex multivariate relations among latent and observed variables (Henseler et al., 2016). Statistical Package for the Social Sciences (SPSS) version 23 was used to conduct the descriptive statistics, demographic information of the respondents, detection of missing values, unengaged responses, treatment of outliers and other preliminary data screening analyses. Partial Least Square-Structural Equation Model (PLS-SEM) path modeling was employed to assess both the measurements and structural model evaluation. Researchers are using this analytical method in statistical path modeling analysis to check the complex multivariate relations among latent and observed variables (Henseler et al., 2016). For model building, prediction of outcome and testing the theories, PLS-SEM is more suitable technique as it is superior strong and flexible (Hair et al., 2016; Henseler et al., 2016).

4. Results and discussion

Demographic analysis

This section presents the result and discussion of the data collected on the effect of revenue leakages on revenue generation of tertiary hospitals in Nigeria. A total number of 334 questionnaires were distributed to the hospital staff using cluster sampling technique. However, out of the total questionnaires distributed, only 292 questionnaires representing 87.4% were retrieved. Out of 292 questionnaires retrieved, 7 of them representing 2.1% were rejected due to incomplete information given by the respondents. Additional 14 questionnaires representing 4.2% were excluded from the data set as a result of outliers. Therefore, the retained and useful questionnaires are 271, representing 81.1% of the total questionnaire distributed. This rate is considered appropriate based on the opinion of Sekaran and Bougie (2013) which argued that 30% of the response is acceptable for a survey. The response rate is presented in Table 2 below.

Table 2: Questionnaire distributed, returned, rejected and exempted

Items	Frequency	Percentage
Distributed questionnaire	334	100.0%
Returned questionnaire	292	87.4%
Rejected questionnaire	7	2.1%
Exempted due to outliers	14	4.2%
Valid questionnaire	271	81.1%
Response Rate		87.4%
Less Rejected		6.3%
Valid Response Rate		81.1%

Source: Field Survey, 2024.

Descriptive analysis

The descriptive statistics provide summaries and characteristics of the data in relationship to a construct or combination of constructs (Tabachnik & Fidel, 2007). Accordingly, the descriptive statistics of this study's variables is as depicted in Table 3. As shown in Table 3, the mean responses ranged from 2.936 to 4.374 for all the latent variables. Specifically, the mean of accountability is 3.551 and the standard deviation is 0.561, showing that the respondents agreed that accountability influences the revenue generation among the Nigerian tertiary hospitals. Connivance had a mean of 2.936 and standard deviation of .725 indicating that the construct has a lesser influence on revenue generation compared to other constructs in the model. Moreover, information technology has a mean of 3.823 and a standard deviation of 0.729 indicating its stronger influence and lesser dispersion. Furthermore, perceived corruption, staff attitude and supervision were found to have 4.374, 3.962 and 3.314 respectively, which

implied that the respondents majorly agree with the contribution of the aforementioned variables toward revenue generation. The standard deviation of the variables also showed 0.667, 0.478 and 0.22 respectively, indicating a moderate dispersion among the variables. Lastly, the revenue generation, which is the dependent variable of this study, had a mean of 4.149 with a standard deviation of .389, showing that the respondents largely agree with the questions asked regarding the construct.

Table 3: Mean and standard deviation of the study variables

Code	Variable	Mean	Std. Deviation
ACC	Accountability	3.551	.561
CON	Connivance	2.936	.725
INT	Information Technology	3.823	.729
PEC	Perceived Corruption	4.374	.667
REG	Revenue Generation	4.149	.389
STA	Staff Attitude	3.962	.478
SUP	Supervision	3.314	.223

Source: Researcher’s Compilation in PLS-SEM 4.0

PLS path model result

In this study, structural equation modeling with Partial Least Squares Estimation (PLS-SEM) approach was used to test the hypotheses proposed earlier. SmartPLS 4.0 statistical application package was used for assessing the Measurement Model (MM), Structural Model (SM) and significance of model in this current study. The measurement model was assessed using five criteria: 1) indicator reliability, 2) internal consistency reliability, 3) convergent validity, 4) discriminant validity, and 5) model fit evaluation (Henseler et al., 2014). The measurement model of the latent constructs after the removal of items below the threshold is as presented in Figure 2. For the internal reliability, out of the total 49 items or cases in the research instrument, the study retained 36 items by deleting up to 13 items that have loadings outside the specified threshold based on the criteria given by Hair et al. (2011) and Hair et al. (2013). Precisely, REG5, REG6, REG7, STA4, STA6, ACC7, PEC7, SUP2, CON4, INT1, INT5, INT6 and INT7 were deleted from the data set before the structural model assessment.

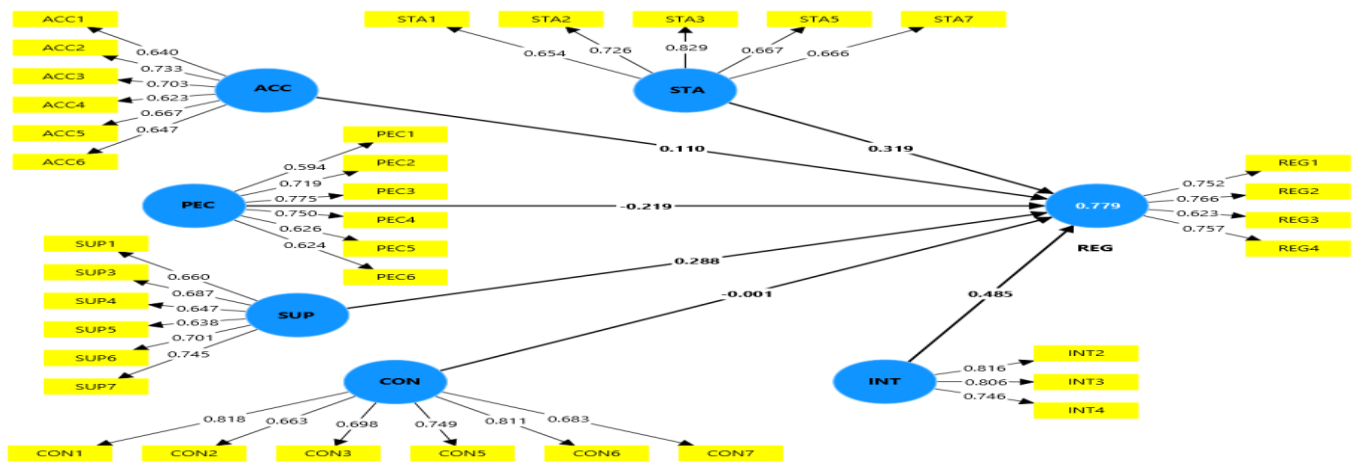


Figure 2: Measurement model

However, this study used Cronbach’s coefficient alpha to measure internal consistency. Generally, the rule of thumb for rating Cronbach’s alpha coefficient was suggested by different scholars. Hair et al. (2019) prescribed that a Cronbach’s alpha coefficient of at least 0.70 is sufficient. In contrast, George and Mallery (2003) provided a ranges for rating the Cronbach’s alpha coefficient which includes greater than 0.90 (excellent), 0.80-0.89 (good), 0.70-0.79 (acceptable), 0.06-0.69 (questionable), 0.50-0.59 (poor) and less than 0.50 (unacceptable).

Model fit evaluation

Following the evaluation of measurement model and structural model, it is necessary to assess the overall model fit by using appropriate criteria. Model fit evaluation is the process of assessing the extent to which a statistical model explains the data that it is designed to analyze. Accordingly, Standard Root Mean Square Residual (SRMR) value was believed to be reliable measure of evaluating model fit in PLS Path modelling (Sarstedt et al., 2021) although Hair et al. (2013) argued that there is no standard global goodness-of-fit criterion in PLS path modelling. As such, PLS-SEM 4.0 was used in this study to conduct the model fitness using goodness of fitness with SRMR value and chi-square statistics (X^2) among indices. According to Sarstedt et al. (2021), the model of a study is considered fit if the SRMR value is above 0.05. Consequently, the SRMR value of this study is 0.125, which is above the threshold of 0.05. Hence, the model of the relationship between the selected independent variables and dependent variable (revenue generation generation) is considered fitted and ready for the analysis. The SRMR value, chi-square and other relevant indices are presented in Table 4 as follows:

Table 4: Model fit estimation

	Saturated model	Estimated model
SRMR	0.125	0.125
d_ ULS	10.485	10.485
d_ G	1.952	1.952
Chi-square	827.152	827.152
NFI	0.474	0.474

Source: Researcher’s Compilation in PLS-SEM 4.0.

Assessment of significance of structural model

The previous section discussed the measurement model of the study which prompted this section to evaluate the structural model of the study. In evaluating the structural model, four assessments are important, which include: 1) assessing the significance of path coefficients through bootstrapping procedure, 2) the assessment of R^2 values, 3) the assessment of effect size of each of the independent construct to the latent dependent construct, and 4) assessing the model’s predictive relevance. Accordingly, standard bootstrapping procedure with 5,000 bootstrapped samples and 271 cases was used in assessing the significance of path coefficients of the structural model in this study. The evaluation of the structural model for the relationships was performed based on the aforementioned four stages, which are explained in the following sub-sections. The Structural Model of this study as depicted in Figure 3 demonstrates the relationships between the latent constructs of this study. P-values were used to ascertain the level of significance of the hypothesized relationships. Hence, a p-value of 5% or less with t-value of 1.96 or more is considered significant. The values depicted in inner model represent the T-value, which indicates the strength and the direction of the relationships between the variables of the study. Precisely, the relationship between staff attitude and revenue generation shows 5.750. This implies that the construct has a strong contribution to the dependent variable and the second-best predictor.

Secondly, accountability shows T-value of 2.371, which suggests that the construct has moderate contribution to the dependent variable. In addition, perceived corruption revealed a T-value of 3.977 which means that it also has moderate contribution to the dependent variable. Furthermore, supervision was found to be the third best predictor of revenue generation with T-value of 4.584, while connivance was found to be the weakest predictor of revenue generation with 0.019 T-value. Moreover, information technology was found to be the strongest predictor of revenue generation with a T-value of 10.904. Subsequently, the evaluation of path coefficients with a combined Beta value, T-value and P-value were discussed in the following subsections for hypotheses testing.

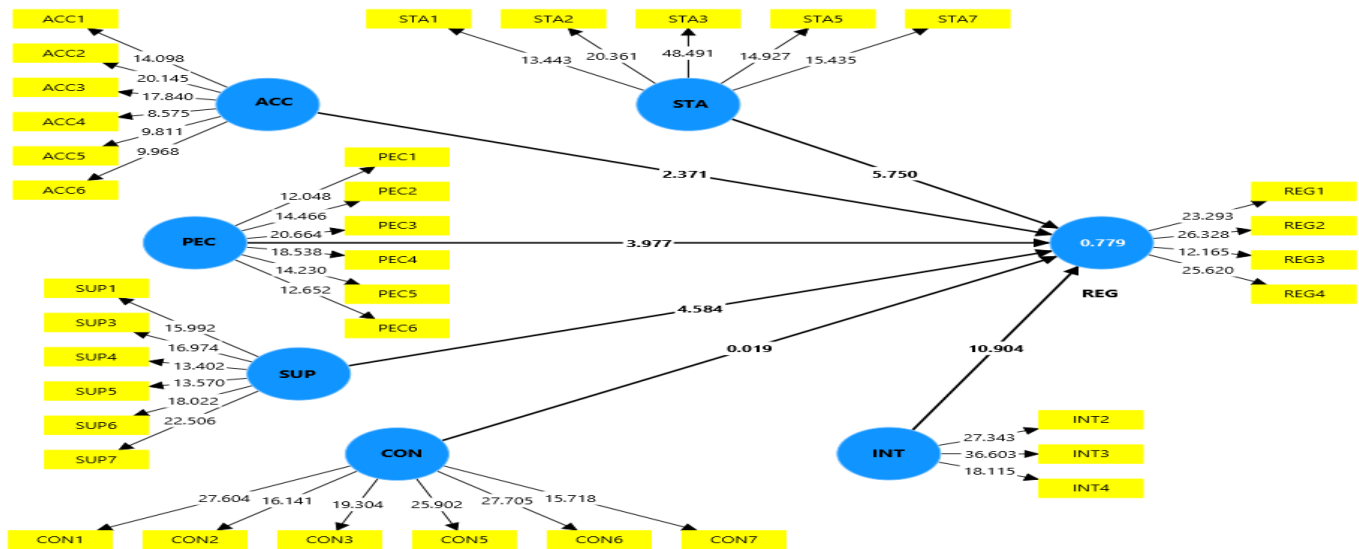


Figure 3: PLS-SEM Structural Model

Evaluation of the significance of path coefficients

Subsequent to the extensive literature review and considering the context of this study (i.e Nigeria’s public health sector), six determinants to proxy revenue leakages were hypothesized as independent variables against revenue generation of tertiary hospitals in Nigeria. The independent variables including staff attitude, accountability, perceived corruption, supervision, connivance and information technology were hypothesized against revenue generation. All these determinants were predicted to have significant relationship with the generation. With evidence from the result of the structural equation model, four of the selected independent variables (staff attitude, accountability, supervision and information technology) affirmed a significant positive effect on revenue generation. However, perceived corruption and connivance were found to have negative and insignificant effect on revenue generation respectively.

The first objective of this study is to investigate the effect of staff attitude on revenue generation of tertiary hospitals in Nigeria. To accomplish this objective, the first hypothesis H₁ was postulated as: *Staff attitude has significant influence on revenue generation of tertiary hospitals in Nigeria*. Accordingly, the result from the PLS structural equation model was able to accept the first hypothesis because it shows a significant positive relationship between the staff attitude and revenue generation in the study area and this signifies the ground for accepting the proposed alternate hypothesis (H₁). Besides, the result revealed that among the six independent variables that were able to explain 77.9% variation in the dependent variable, staff attitude is the second strongest predictor of revenue generation ($\beta = 0.319$, $t = 5.750$, $p = 0.000$). Thus, increase in good staff attitude will lead to an increase in revenue generation among Nigerian tertiary

hospitals and vice versa. Accordingly, the findings of this study are consistent with some findings in the previous studies that examined similar relationships. For example, this result is consistent with the Ghanaian study conducted by Soale and Akudugu (2021) which examines the causality between employee attitude and the performance of senior staff of University of Cape Coast. The PLS analytical result shows that staff attitude has significant positive effect on revenue generation in the university. Other studies that found similar results include Abun et al. (2021), Ogilo et al. (2020), Nwubiko (2019), Abba (2019), Sokoh (2018). The findings of these studies served as justification for the current study. However, the practical implication of this result is that the attitude of revenue staff among the Nigerian federal tertiary hospitals makes them more focused and committed to delivering effective revenue generation services. This reduced the level of employee turnover and operational challenges, which in turn promote public hospitals' reputation and fosters patient's retention.

The second objective of the study is to examine the influence of accountability on revenue generation among tertiary hospitals in Nigeria. This led to the formulation of the second hypothesis H_2 , which stated that: *Accountability has significant influence on revenue generation of tertiary hospitals in Nigeria.* Accordingly, the PLS-SEM result on this relationship is able to accept the second hypothesis by showing a significant positive relationship between accountability and hospitals revenue generation in Nigeria. Statistically, the result revealed that among the six independent variables of this study, accountability was found to be the fifth best predictor of revenue generation in the study area ($\beta = 0.110$, $t = 2.731$, $p = 0.018$). Hence, the second hypothesis H_2 is accepted. In view of the forgoing, increase in accountability will lead to increase in revenue generation among Nigerian tertiary hospitals and vice versa. Consequently, numerous studies were used to justify the results established on this relationship. Among others, Ani (2022) found a significant positive effect of financial accountability on revenue administration and revenue generation, which is similar to the result of the current study. The findings also corroborate with Nwokike et al. (2021), Oloaye et al. (2021), Olugbusi and Ojo (2021) and Augustine et al. (2019), Han and Hong (2019). The aforementioned studies found positive relationship between accountability and revenue generation in different contexts. In real life scenario, the implication of this result may be because, accountability in revenue administration of Nigerian hospital reduces revenue leakages by minimizing fraudulent activities, mishandling of billings, errors and other financial malpractices. As such, government, donors and other stakeholders have confidence and trust in the hospitals' operations which promote continuous funding and patronage which contribute to hospitals' financial success.

The third objective of this study assesses the influence of perceived corruption on revenue generation of tertiary hospitals in Nigeria. This led to the formulation of the third hypothesis H_3 , which stated that: *perceived corruption has significant influence on revenue generation of tertiary hospitals in Nigeria.* In line with the expectation, the empirical result from PLS-SEM in this study was able to accept the hypothesis as it shows a significant negative relationship between perceived corruption and revenue generation of tertiary hospitals. Statistically, the result revealed that among the six predicting determinants of revenue leakages in the health sector, perceived corrupt was found to be the fourth best predictor of hospitals' revenue generation ($\beta = -0.219$, $t = 3.977$, $p = 0.000$). Accordingly, the third hypothesis H_3 is accepted and the alternate hypothesis H_{13} is accepted. Consequently, increase in the perceived corruption among revenue staffs in the hospitals will lead to reduction in the amount of revenue generation and vice versa. The findings of this study also corroborate with the result of Mohamed et al. (2022) which found that corruption, regulatory burden and political instability have significant negative effect on tax revenue of public sector entities. Also, the result aligns with the findings of Yaru and Raji (2022), Nyabunze and Siavhundu (2020), Obaid and Udin (2020), Augustine and Enyi (2020). These studies provide empirical validation for the result of this study. Practically, this result implies that, corrupt practices among

Nigerian federal tertiary hospitals such as bribery and bill fraud carted away funds from the hospitals in such a way that money that could be used for hospitals operational activities is lost, which reduce the overall revenue. Moreover, perceived corruption among staff could tarnish the hospitals' image within the community, partners and patients. As such, this reputational damage leads to decrease in patients' referrals, donor support and collaboration among which erode the revenue generated by the hospitals. The fourth objective of this study is to examine the influence of supervision on revenue generation of tertiary hospitals in Nigeria. This objective lead to the fourth research hypothesis H_4 , which states that: *supervision has significant influence on revenue generation of tertiary hospitals in Nigeria*. In line with the predicted relationship, the empirical result from PLS-SEM in this study was able to accept the hypothesis and it shows a significant positive relationship between supervision and revenue generation of tertiary hospitals in Nigeria. The result shows that among the six independent variables of this study, supervision was found to be the third best predictor with β value of 0.288, t-value of 4.584 and p-value of 0.000. Therefore, the fourth hypothesis is accepted. In this case, increase in the level of supervision will lead to increase in the revenue generation among tertiary hospitals. Moreover, the justification of the result on the relationship between supervision and revenue generation is the study of Nwosu et al. (2021), which revealed that supervision positively promotes job performance. Equally, this result aligns with Hannang et al. (2020), which found significant positive effect of supervision on performance similar to the present research. Other studies such as Lee and Kusumah (2020); Wiyono et al. (2020); Mustapha and Edegware (2017); Koske and Atambo (2018) affirmed this result by revealing a significant positive relationship between supervision and revenue generation. Besides, the practical implication of this result could be because the timely supervision of the revenue staff in Nigerian federal tertiary hospitals ensures that the staffs adhere to financial procedures and policies of proper collection and reporting. This adherence will in turn reduce revenue leakages caused by mismanagement, errors and fraud which ultimately enhance the revenue performance of the hospitals.

The fifth objective of the study examines the influence of connivance on revenue generation of tertiary hospitals in Nigeria. This led to the formulation of the fifth hypothesis H_5 , which stated that: *connivance have significant influence on revenue generation of tertiary hospitals in Nigeria*. Surprisingly, the empirical result from PLS-SEM in this study was not able to accept the proposed hypothesis as it shows an insignificant relationship between connivance and revenue generation. Statistically, the result revealed that among the six proxy determinants of revenue leakages in the present study, connivance was found to be the least (weakest) predictor of revenue generation ($\beta = -0.001$, $t = 0.053$, $p = 0.985$). Based on this finding, the fifth hypothesis H_5 cannot be accepted. Therefore, increase or decrease in connivance among staff will not affect the revenue generation among tertiary hospitals in Nigeria. The insignificant findings between connivance and revenue generation in this study can be justified by the study of Shenoy (2008), which found insignificant relationship between collusion rationale and the efficiency of vertical integration among United State companies.

However, this result contradicts larger part of the literature such as Mbarawii and Maclean (2023) which investigate the impact of collusion on the performance of students among public secondary schools in Rivers state of Nigeria. The study found a significant negative effect of collusion on the performance unlike the present study, which found an insignificant effect. This result also opposed the finding of Wipulanusat et al. (2021) which examined the effect of cross-departmental collusion on organizational performance of federal highway administration and found a significant relationship between the variables. This result contradicts many other studies such as Obiekwe et al. (2021), Askari et al. (2020), Wanyeki et al. (2019), Ali and Reuben (2019) and Phina et al. (2018). These studies among others found a significant effect of collusion or collaboration on performance. The possible reason for this contradiction

may be due to the predominance of informal revenue streams relied upon by the federal tertiary hospitals in Nigeria as the hospitals mostly depend on government funding and donations from international organizations (such as USAID, WHO etc.) among other informal revenue sources. As such, connivance among staff in revenue collection procedure might not pose significant threat to optimal revenue generation and performance due to informal streams domination. The result may also be due to the existing poor system of revenue collection in the hospitals, which overshadowed the problems of connivance as the revenue performance is already sleazy.

The sixth objective of this study is to examine the influence of information technology on revenue generation of tertiary hospitals in Nigeria. This objective lead to the sixth research hypothesis H_6 , which states that: *information technology has significant influence on revenue generation of tertiary hospitals in Nigeria.* In line with the anticipated relationship, the empirical result from PLS-SEM in this study was able to accept the hypothesis and it shows a significant positive relationship between information technology and revenue generation in Nigerian tertiary hospitals. Statistically, the result revealed that among the six independent variables of the study that determine the revenue generation, information technology was found to be the best and strongest predictor with β value of 0.485, t value of 10.904 and p-value of 0.000. Accordingly, the sixth hypothesis H_6 is accepted. Hence, increase in the availability and utilization of information technology in revenue collection will lead to an increase in revenue generation among tertiary hospitals in Nigeria. Empirically, the validation of this result on information technology-revenue generation relationship can be made by the study of Nyoka et al. (2023), which examined the impact of electronic collection system (e-collection) on revenue generation in Kassena Nankana Municipality of Kenya. The study found a positive relationship between the ICT and revenue generation, which means increase in ICT usage will increase the revenue generation similar to the present research.

In Nigeria, Umar et al. (2023) affirmed this result by examining the effect of ICT on revenue generation in Gombe State Internal Revenue Service. It was found that ICT usage has significant positive implication on the revenue generation, which was extended and validated by the present study. Kanyungu and Aunga (2019) found similar result in Tanzania. Lee and Choi (2016) report a significant positive relationship between ICT usage and revenue generation in United States. Kaunainfathima and Moyeenudin (2019) confirmed significant positive relationship between technology and revenue generation in India. Practically, the likely implication of this result could be that the IT system in the hospitals streamlines the revenue cycle management as the automated processing and the relevant accounting software reduce the delay in financial processing. This is important because individuals are often in haste to complete financial transactions in hospitals to go and take care of their patients. The systems also contribute to reducing the manual errors in payment collection, which improve efficiency and accuracy in revenue operation in the hospitals and also reduce the revenue leakage that erodes the generated revenue.

5. Conclusion

The objective of this study is to examine the effect of revenue leakages on revenue generation among tertiary hospitals in Nigeria. Findings from this study suggest that staff attitude, accountability, supervision and information technology have significant positive effect on revenue generation of tertiary hospitals in Nigeria. On the other hand, perceived corruption was found to have significant negative effect on revenue generation of tertiary hospitals, while connivance was found to be insignificantly related to the revenue generation among the Nigerian tertiary hospitals. Based on the findings, the study concludes that, revenue leakages have significant effect on revenue generation among tertiary hospitals in Nigeria.

The study stressed that it is imperative for the federal government to make effort to address leakages in Nigerian tertiary hospitals through reforms, more openness and fortified institutional frameworks. Hence, plugging revenue leakages in federal tertiary hospitals will play a pivotal role in enhancing the hospitals revenue generation by ensuring a transparent financial practice that reduces the opportunities for fraud and mismanagement.

Nevertheless, the study has some limitations that need to be addressed by future studies. Firstly, it will be difficult to generalize the finding of this study beyond financial administration of the hospitals as the data was collected from revenue staff only. As such, the perceptions regarding revenue generation may differ between staff of other departments as well as top administrators in the hospitals. Therefore, it is worthy for future studies to expand the population and include top management as part of the respondents. In addition, the study used data from 271 respondents in Northeastern Nigeria that will be generalized to the entire tertiary hospitals in Nigeria. Hence, increasing the sample and geographical proximity of the study to other regions of the country will be important for future research.

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