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Mediating Role of Knowledge Sharing Between Transformational Leadership and Innovative Service Delivery Among Nurses in the Federal Medical Centers of North East Nigeria

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ABSTRACT

In a style of a quantitative research, the study examines the mediating role of knowledge sharing between transformational leadership and innovative service delivery of health workers (nurses) in the federal medical centers within northeastern Nigeria. The research methodology applied a descriptive survey and a cross sectional study using structured questionnaires. The population of the study was 3200 nurses of the federal medical center of the north east Nigeria and the sample size was 534. Data were analyzed using Smart-PLS 4.0. The findings of the study shows that transformational leadership strongly influences innovative service delivery ($\beta=0.328$, $t=4.218$, $p=0.000$), Knowledge sharing is impacted by transformational leadership ($\beta=0.760$, $t=31.062$, $p=0.000$), Knowledge Sharing significantly affects Innovative service Delivery. ($\beta=0.527$, $t=6.873$, $p=0.000$), Knowledge sharing strongly influences the link between Transformational Leadership and Innovative service Delivery ($\beta=0.400$, $t=6.454$, $p=0.000$). The study recommends that further studies should take into consideration other sectors of the economy, such as the manufacturing, technological and educational sector. Again, a longitudinal study should be carried out and other regions in the country should be studied to compare results

INTRODUCTION

The health sector is crucial for the economic development of nations, with developed countries like the US and UK implementing budgets for health sector growth. In Nigeria, the 2022 budget allocates ₦835 billion to the healthcare sector, a significant portion of which is set aside for the ministry of health (Federal Government of Nigeria 2022 Approved Health Budget Analysis, 2022). This is significantly lower than the 15% benchmark set by the African Union leaders. The estimated healthcare investment for Nigerians is as low as ₦11 per day, ₦330 per month, and ₦3,967 per year (Abubakar et al., 2022). Despite Nigeria's largest gross domestic product in Africa, its per capital income is low, leading to an inequitable distribution of income, wealth, and health.

The Nigerian healthcare system is structured into three levels: federal, state, and local. The federal government manages tertiary healthcare, while the state handles secondary healthcare (Federal Ministry of Health, 2019). The local government handles primary healthcare. The Federal Ministry of Health (FMOH) handles policy making, technical support, national health management, and health services delivery at the federal level (Federal Ministry of Health, 2019).

Nigeria's public health care services are underfunded and poorly managed, leading to uninnovative service delivery by nurses (Orekoya & Omobola, 2018). Lack of state-of-the-art facilities, motivation, and a conducive work environment have resulted in unprofessional practices such as administering injections without spirit or cotton, putting pressure on patients, and performing circumcisions with razor blades (Apex-Apeh et al., 2020). This has led to the government spending over \$1.6 billion on medical tourism annually, resulting in a loss of almost ₦576b in Nigerian currency (The Guardian, 2022). In contrast, nurses in other countries are more innovative due to modern facilities and training, using protective items, robots, and machine detection for vein detection (International Council of Nurses, 2023).

In resource-limited countries, maintaining a quality and accessible healthcare system is challenging due to chronic resource mismanagement, leadership shortages, and a lack of innovation (Saeed et al., 2022). 70% of the population relies on private healthcare institutions. Significant reforms are needed to improve healthcare leadership governance and introduce innovations at all levels to address the public sector's shortcomings (Saeed et al., 2022).

Between 2000-2019, Nigeria's tertiary hospitals faced public criticism for substandard services and poor infrastructure (Alkali & Bello, 2020). Despite government intervention, policies like the Service Compact with All Nigerians (SERVICOM) and the Consumer Protection Council's Patients' Bill of Rights have not been effective in improving hospital standards (Tolu-Kolawole, 2021). Between March 2021 and March 2022, 7,256 trained Nigerian nurses relocated to the UK, the highest number recorded in the last five years and the highest annual increase within the period (Tolu-Kolawole, 2021). This mass relocation has significant implications for the understaffed healthcare sector in Nigeria, which has approximately 88.1 nurses per 100,000 members of the population. Nigeria has the third-largest source of foreign nurses in England, behind the Philippines and India (Tolu-Kolawole, 2021). This brain drain is a significant loss for Nigeria's health industry and the country's economy.

Transformational leadership encourages employee learning and development by encouraging contributions to new ideas and knowledge dissemination, leading to creativity (Kurniawan et al., 2019). Previous studies in various fields support its impact on knowledge acquisition, as evidenced by Soda et al., Suifan & Janini, and Kurniawan et al., 2019.

This study explores the impact of transformational leadership on innovative service delivery and knowledge sharing. Scholars argue that this leadership style is highly effective in fostering knowledge sharing activities and achieving organizational objectives, as the global market rewards firms that can develop, share, and apply

knowledge more quickly than their competitors (Son, Phong & Loan, 2020; Shaikh et al., 2022; Chaman et al., 2021).

Knowledge sharing is a social interaction culture that involves the exchange of employee knowledge, experiences, and skills across departments or organizations (Yin et al., 2020). It involves explicit or implicit knowledge that contributes to organizational knowledge development and progress. The earliest known forms of knowledge sharing date back to cave drawings in 15,000 BC, evolving into more sophisticated documentation. The invention of the printing press in 1440 made information easily distributed via print material, but libraries were not accessible to the general public until over 400 years later (Hu, et al, 2023; Ibuewuchi & Wurim, 2022; Talat et al., 2022). Knowledge sharing positively impacts innovative service delivery.

This study aims to address the unprofessional attitude and work behavior of nurses in tertiary health centres in north-eastern Nigeria, focusing on the lack of transformational leadership and state-of-the-art facilities. Limited empirical findings and the introduction of mediators are suggested to improve the professional development of nurses in these areas (Kim, Li, Yoo, et al., 2020; Lei, Leaungkhamma & Le, 2020; Le & Lei, 2019).

1. Research Questions

The following research questions are formulated to guide the research:

1. Does transformational leadership affect innovative service delivery?
2. What is the significant relationship between transformational leadership and knowledge sharing?
3. What is the significant relationship between knowledge sharing and innovative service delivery?
4. Knowledge sharing may not mediate the relationship between transformational leadership and innovative service delivery.

2. Objectives of the Study

The broad objective of this research is to examine the roles of transformational leadership, knowledge sharing, and innovative service delivery of health workers (nurses) within northeastern Nigeria. The following objectives are formulated to be achieved:

1. To determine the relationship between transformational leadership and innovative service delivery?
2. To determine the relationship between transformational leadership and knowledge sharing?
3. To investigate the effect of knowledge sharing and innovative service delivery?
4. To determine whether knowledge sharing mediates the relationship between transformational leadership and innovative service delivery.

Research Hypotheses

To effectively address the basic research questions and to meet the related objectives, the following research hypotheses were formulated to be tested:

- Ho₁: There is no significant relationship between transformational leadership and innovative service delivery.
- Ho₂: There is no significant relationship between transformational leadership and knowledge sharing.
- Ho₃: There is no significant relationship between knowledge sharing and innovative service delivery.
- Ho₄: Knowledge sharing does not mediate the relationship between transformational leadership and innovative service delivery.

METHODS

Population and Sample

1. Population of the Study

The population of this study includes health workers (nurses) from the Federal Medical Centres of the six states in North-East Nigeria (Adamawa State, Bauchi State, Borno State, Gombe State, Taraba State, and Yobe State). The number of nurses

in the Federal Medical Centre in North-East Nigeria is 3200 (three thousand, two hundred).

2. Sample Size of the Study

The study employed the Taro Yamane formula to arrive at its sample size. This formula is shown in the equation below:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

N= Population size

n= Sample size

e= Level of precision

1= Constant

$$n = \frac{N}{1 + N(e)^2}$$

$$n = 3200 / (1 + 3200(0.05)^2)$$

$$n = 3200 / (1 + 3200(0.0025))$$

$$n = 3200 / (1 + 8)$$

$$n = 3200 / 9$$

$$n = 356$$

From the above calculation, the sample size of this study is three hundred and fifty-six thousand naira (356). Roscoe's rule of thumb concerning sample size suggested that the appropriate number of sample subjects for most research shall be between 30 –500 (Hill, 1998). Hence, following the aforementioned rule of thumb, the sample size of the present study (i.e., 356) is also appropriate for the study. Similarly, research methodology writers have supported this notion. For example, Sekaran and Bougie (2009:2013) held that a sample size between 30 and 500 is the most appropriate for research in the field of social sciences. However, due to the constant nature of low response rates in survey studies, any researcher needs to take all necessary measures to mitigate the non-response rate as much as possible, to deal with the possibility of non-response that often renders research invalid (Groves, 2006). Thus, to reduce the non-response rate, the present study adhered to Salkind's view for adjusting sample size, which is commonly used in survey research (Salkind, 2012). This view suggested that the sample size could be increased by 40 percent to 50 percent to cover the possibility of lost questionnaires and uncooperative subjects (Bartlett et al., 1977). Hence,

in the present study, the sample size was increased by 50 percent as shown below:

$$y = \frac{1}{356} \times \frac{50}{100}$$

Where:

y = Unknown increase of 50%

1 = Constant

356 = Actual sample size

100 = Percentage

Now cross multiplication:

$$y = \frac{1}{356} \times \frac{50}{100}$$

$$y = \frac{1 \times 50}{356 \times 100}$$

$$y = \frac{50}{35600}$$

$$y = \frac{100}{71200}$$

$$y = 178$$

Therefore, 50 percent of the study sample size is 178, whereas the original sample size is 356. Hence, the new sample size that has been drawn from the study population is 534 healthcare workers (nurses) of the Federal Medical Center in North Eastern Nigeria. However, instead of 356, which is the initial sample size, 534 survey instruments will be issued to the randomly sampled nurses. Even though research that is concerned with survey instruments may not escape the possible refusal by some sample subjects, such an increase in sample size mitigates the size of the non-response rate. The proportions for each state were as follows: Adamawa-63, Bauchi-52, Borno-69, Gombe-65, Taraba-52, and Yobe-55.

RESULTS AND DISCUSSION

Method of Data Analysis

Data analysis was conducted using partial least square (PLS) software version 4, an approach to structural equation modeling and presented as required. The PLS-SEM in study tested for the measurement model and the structural model.

Measurement Model

The measurement model assesses the constructs involved in the study, which is to determine whether the indicators such as, Composite reliability (CR), convergent validity, average variance extracted (AVE) and discriminant validity, as described by Hair et al. (2011), Hair et al (2012)

and Henseler et al (2009) met their required threshold.

Table 1. Convergent Validity

Construct	Items	Loadings	AVE	CR
Innovative Service Delivery	ISD1	0.743	0.634	0.924
	ISD2	0.831		
	ISD3	0.848		
	ISD4	0.846		
	ISD5	0.784		
	ISD6	0.756		
	ISD7	0.757		
Knowledge Sharing	KS1	0.748	0.612	0.887
	KS2	0.794		
	KS3	0.787		
	KS4	0.790		
	KS5	0.791		
Transformational Leadership	TL3	0.850	0.698	0.920
	TL4	0.824		
	TL5	0.856		
	TL6	0.843		
	TL7	0.804		

The result in Table 1 shows the convergent validity for the constructs under study. The results thus demonstrated a high level of convergent validity of the latent construct and used in the

model. An AVE value of at least 0.5 indicates sufficient convergent validity, meaning that a latent variable can explain at least half of the variance of its indicators on average.

Table 2. Heterotrait-Monotrait Ratio (HTMT) Discriminant Validity

	ISD	KS	TL
ISD			
KS	0.872		
TL	0.806	0.874	

Table 2 show the discriminant validity result. According to Henseler, Ringle, & Sarstedt (2015: 121), a well-fitting model should indicate that the heterotrait correlations should be smaller than monotrait correlations, meaning that the HTMT ratio should be below 1.0, Henseler, Ringle, & Sarstedt (2015: 121) suggested that if the HTMT value is below 0.90, discriminant validity has been established. Gold et al. (2001) and Teo et al. (2008) also use the .90 cutoff, though Clark & Watson (1995) and Kline (2011) use the more stringent cutoff

of .85. Results in Table 1 indicated that discriminant validity was established.

The Structural Model

Structural model fitness is examined after measurement model assessment has been met and fitness is shown to be acceptable. The structural or inner model consists of the factors and the arrows that connect one factor to another. The loadings of the direct paths connecting factors are standardized regression coefficients. To ensure that the final estimated result from the PLS is true, it is important

to determine the fitness of the model. The fitness of the model can be assessed in the following ways; testing for co linearity of the structural model, assessing the significance and relevance of the structural model relationships, the level of the R2 values, and the f2 effect size (Tenenhaus, Vinzi, Chatelin & Lauro 2005). Höck & Ringle, (2006) described results above the cutoffs 0.67, 0.33 and 0.19 to be “substantial”, “moderate” and “weak” respectively. The R-square here would be considered to be of moderate strength or effect.

To assess multicollinearity in the structural model, tolerance or VIF criteria may be applied,

discussed and illustrated. The VIF benchmark should be less than 4.

The f-square effect size measure is another name for the R-square change effect. The f-square coefficient can be constructed equal to $(R2_{original} - R2_{omitted}) / (1 - R2_{original})$. The denominator in this equation is “Unexplained”. The f-square equation expresses how large a proportion of unexplained variance is accounted for by R2 change (Hair et al., 2014). Following Cohen (1988), .02 represents a “small” f2 effect size, .15 represents a “medium” effect, and .35 represents a “high” effect size.

Table 3. Structural Fitness Indices

Construct	Items	VIF	R ²	f ²	Q ²
Innovative Service Delivery	ISD1	2.157	0.649	0.334	0.527
	ISD2	3.477			
	ISD3	3.987			
	ISD4	3.344			
	ISD5	2.252			
	ISD6	2.646			
	ISD7	2.510			
Knowledge Sharing	KS1	1.807	0.577	0.334	0.570
	KS2	2.285			
	KS3	1.984			
	KS4	2.280			
	KS5	2.216			
Transformational Leadership	TL3	2.867	0.130	0.130	
	TL4	2.211			
	TL5	2.757			
	TL6	2.602			
	TL7	2.132			

Table 3 also presents the VIF diagnostic and estimated PLS weights for the indicators of all the items from the questionnaire. A common rule of thumb is that problematic multicollinearity may exist when the variance inflation factor (VIF) coefficient is higher than 4.0 (some use the more lenient cutoff of 5.0). None of the original indicators had VIF greater than 5.

The overall effect size measure for the structural model, as in regression, indicated that 64.9% and 57.7% of the changes in the innovative service delivery and knowledge sharing respectively are explained by the effect of transformational leadership.

The f-squared showed the individual effect of knowledge sharing and transformational leadership on innovative service delivery. The result revealed that the effects of knowledge sharing and

transformational leadership on innovative service delivery are considered to have medium effect and small effect respectively.

Based on the result of the SRMR the model is a good fit model since SRMR is within the

threshold of than .08 which 0.080. The Q2 was estimated by the blindfolding method. The values of the Q2 are 0.527 and 0.570 indicated that since they are greater than zero, they have predictive relevance for this study.

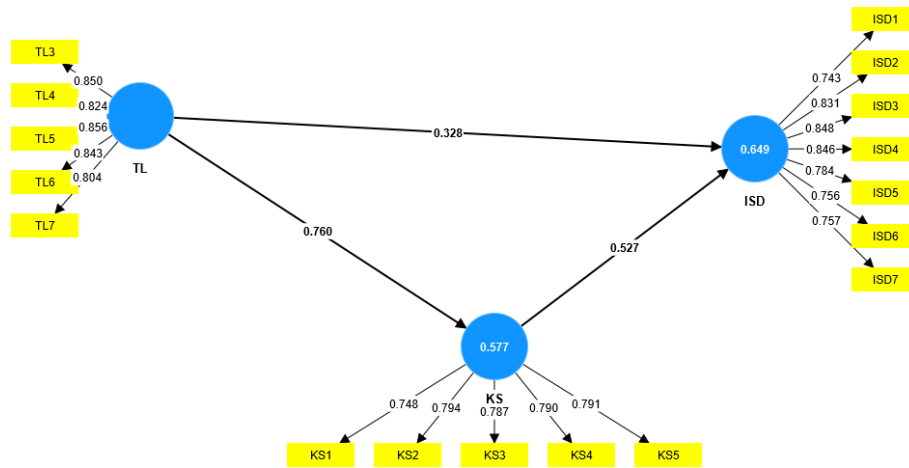


Figure 1. PLS-SEM Structural Model

Table 4. PLS-SEM Result

Variables	Coeff. B	Std err	t-test	P-value	Decision
TL ->ISD	0.328	0.078	4.218	0.000	Significant
TL ->KS	0.760	0.024	31.062	0.000	Significant
KS ->ISD	0.527	0.077	6.873	0.000	Significant

The outcome showed that the null hypothesis was rejected; supporting the alternative hypothesis that transformational leadership strongly influences innovative service delivery among nurses in Federal Medical Centers in North-East Nigeria. ($\beta = .328$, $t = 4.218$, $p = 0.000$). This implied that increasing transformational leadership will probably improve the delivery of innovative services. The result is consistent with Nasir et al. They discovered that transformational leadership and employee performance are positively correlated in 2022. Furthermore, it backs up the findings of Rasheed et al. (2021), who discovered a strong link between transformative leadership and innovation. The study's conclusions suggest that organizational factors that influence employee innovation may include transformational leadership. As a result of logistical challenges, political interference, a lack of

human resources, and financial constraints, which are the problems impeding service delivery in the Town Council, Atiku et al. (2023) revealed an insignificant relationship between transformational leadership and service delivery? Similar to Atiku et al.'s research, Akay and Demirel's (2018) study in Turkey found that organizational innovation service delivery was not directly impacted by transformational leadership.

Knowledge sharing is impacted by transformational leadership. The outcome, which demonstrated transformational leadership in nurses at Federal Medical Centres in the North-East of Nigeria on innovative service delivery ($\beta = 0.760$, $t = 31.062$, $p = 0.000$), supports the postulation of this hypothesis. This shows that innovative service delivery among nurses at the federal medical facility has been impacted by transformational leadership. This finding confirmed that transformational

leadership has a favourable significant influence on knowledge sharing in Indonesia, as found by Shaikh et al. in 2022. Again, the results of the current study were consistent with those of Aydn and Erklç (2020), who looked into how knowledge sharing affected the relationship between transformational leadership and innovative behaviour at work. The findings of the study showed that knowledge sharing is favourably impacted by transformational leadership (TL). The outcome supported Son and Phong's (2020) research, which demonstrated that transformative leadership has a stronger impact on knowledge sharing.

Knowledge Sharing significantly affects Innovative service Delivery. The results of this hypothesis reveal that Knowledge Sharing significantly influences the provision of innovative services ($\beta = 0.527$, $t = 6.873$, $p = 0.000$), supporting the alternate hypothesis and rejecting the null hypothesis. This implied that the nurses working in Federal Medical Centres in North East Nigeria provide more innovative services the more

knowledge is shared. This result is consistent with what Nabi et al. (2022) found, which is that knowledge sharing influences radical innovation favourably. The findings concur with those of Imam and Ebiefung (2022), who discovered that knowledge sharing has a strong beneficial association with the provision of information services. Similar results were seen in the Indonesian study by Sunarta et al. (2020), which showed that KS significantly influenced service improvements at hotels.

Mediating role of Knowledge Sharing

Two conditions must be met for mediation to occur:

1. The first condition requires that the t-value is ≥ 1.65 for one-tailed test.
2. The second condition based on the contributions of Preacher and Hayes (2008) there must be non-zero linking the upper class interval (UCL) and lower class interval (LCI).

Table 5. PLS-SEM Result for Transformational Leadership, Knowledge Sharing and Innovative Service Delivery

	Coeff. β	Std err	t-test	LCI	UCI	Decision
TL -> KS ->ISD	0.400	0.062	6.454**	0.287	0.529	Significant

From Table 6, based on the first condition, the t-test value is 6.454 which is greater than 1.65, while the (LCI=0.0287, and the UCI=0.529) do not have zero (0) between upper and lower class interval. Thus, Knowledge sharing strongly influences the link between Transformational Leadership and Innovative service Delivery, rejecting the null hypothesis and confirming the alternative hypothesis ($\beta = 0.400$, $t = 6.454$, $p = 0.000$). This implied that Knowledge sharing serves as an important mechanism that mediates the relationship between Transformational Leadership and Innovative service Delivery This finding supports the highlight made by Otair et al. (2022) that knowledge sharing mediates the impact of TL and innovative performance. Also, Shaikh et al. (2022) found that knowledge sharing mediated the

association between transformational leadership and innovative work behavior. Again, Nabi et al. (2022) found that knowledge sharing positively mediated the relationship between TL and RI.

CONCLUSION

The study examines the mediating role of knowledge sharing between transformational leadership and innovative service delivery of health workers (nurses) in the federal medical centers within northeastern Nigeria. The results shows that transformational leadership strongly influences innovative service delivery ($\beta = .328$, $t = 4.218$, $p = 0.000$), Knowledge sharing is impacted by transformational leadership ($\beta = 0.760$, $t = 31.062$, $p = 0.000$), Knowledge Sharing significantly affects Innovative service Delivery. ($\beta = 0.527$, $t = 6.873$, p

= 0.000), Knowledge sharing strongly influences the link between Transformational Leadership and Innovative service Delivery ($\beta = 0.400$, $t = 6.454$, $p = 0.000$). The study recommends that further studies should take into consideration other sectors of the economy, such as the manufacturing, technological and educational sector. Again, a longitudinal study should be carried out and other regions in the country should be studied to compare results.

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