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FACTORS AND DETERMINATIONS OF HEALTH INSURANCE SATISFACTION: A PLS-SEM APPROACH OF POLICYHOLDERS IN SUDAN

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ABSTRACT

This paper examines the most significant factors of health insurance satisfaction among covered people in Khartoum, Sudan, through Partial Least Squares Structural Equation Modeling (PLS-SEM). A structured questionnaire was used to take primary data and a total of 350 health insurance policyholders had to fill the survey questionnaire out of which 318 were accurate answers that were retained after data screening. The research paper analyses five latent variables, which include quality of the services, trust, affordability of premiums, efficiency of settling claims and satisfaction with health insurance in general. The results of the analytical investigation indicate that the positive impact of services quality and efficiency in settling claims has the greatest influence on the contentment of the policyholders, then the trust and affordability of the premiums. The model is robust as it has a high explanatory power and predictive relevance as shown by the structural model.

The results offer great information to policymakers, insurance regulators, and service providers who want to develop customer-oriented health insurance schemes. This approach can be improved through focusing on excellence in service delivery, transparency in the administration, and making health insurance affordable to customers to increase their satisfaction level and encourage long-term commitment by the policyholders. The research adds to the expanding literature on the empirical work on health insurance performance in the developing economies and provides viable suggestions on how insurance delivery can be enhanced in Sudan.

KEYWORDS: Health Insurance, Financial Risk, Claim settlement, PLS-SEM, Premium, Efficiency, Trust.

INTRODUCTION

Health insurance is a critical factor in enhancing access to health care services, reducing financial exposure and promoting the wellbeing of the population especially in developing and transitional economies where funding health care has been a thorn in the flesh. Over the past few years, Sudan has been experiencing high rates of health insurance covers as a result of government projects and participation in the sector(Silverberg et al., 2009). Although this growth has been witnessed, there has been a mixed-level of satisfaction among policyholders as a manifestation of variations in service quality, affordability of premiums, trust in insurance companies, and effectiveness in administrative operations. This knowledge of these determinants is essential in order to make health insurance systems sustainable and effective(Kim et al., 2023).

Health insurance has become a staple of all healthcare systems in the world especially where an overwhelming financial load on an individual and household is witnessed because of healthcare expenditures(Robinson, 1988). In most emerging economies, lack of comprehensive insurance cover means that the citizens face disastrous medical expenses which in most cases translate to late treatment, less medical use and economic distress in the long run. Health insurance systems tackle those issues through risk pooling of the population and making healthcare services more equitable(Souba, 1996).

The healthcare system of Sudan exists in a complex socio-economic environment that is highlighted by differences in income, lack of resources in the public healthcare and an increase in healthcare costs(Souba, 1996). In a response to these challenges, Sudanese government and the private insurance companies have developed efforts to increase health insurance cover particularly in the urban areas like Khartoum. These initiatives are to minimize out-of-pocket spending, enhance care accessibility, and enhance health outcomes("20th Am. Conf. Inf. Syst. AMCIS 2014," 2014; Aljehani et al., 2024).

As more people enroll to health insurance schemes, dissatisfaction by the policy holders is also a major issue. The most frequently issued complaints are those associated with the accessibility of the services, the delays in the processing of the claims, the perceived insufficiency of the coverage, and the lack of transparency in the insurance business. This kind of dissatisfaction will deter the belief in insurance systems and can lead to non-participation in the future hence jeopardizing the sustainability of the health insurance schemes(Souba, 1996).

The satisfaction of the policyholders is now becoming an important gauge of performance of the health insurance systems. When policyholders are satisfied, they will renew their policies, pay their premiums, and be proactive in seeking healthcare services. Negative impressions, decreased use, and opposition to policy changes on the other hand may be the results of dissatisfaction(Zhu & Chen, 2025). Accordingly, it is important that the policymakers and practitioners in a bid to enhance the insurance outcomes should determine and comprehend the determinants of health insurance satisfaction.

The research problem of this study is to investigate the major variables that have an impact on health insurance satisfaction among policyholders in Khartoum, Sudan. Through a PLS-SEM design, the research offers a combined analysis of service quality, trust, premium affordability and efficiency in settling claims as predictors of overall satisfaction(De Jonge et al., 2011). The study also provides the evidence of its research done in a developing economy setting and provides practical suggestions on how to enhance the health insurance systems.

Literature Review

Health insurance satisfaction is widely conceptualized as a multidimensional construct shaped by both functional service attributes and psychological perceptions. It reflects policyholders' cumulative evaluation of their experiences with insurance providers, healthcare facilities, and administrative processes over time. Understanding these dimensions is critical for improving service delivery and policy effectiveness(Brati & Braimllari, 2025).

Service Quality

Service quality represents one of the most influential determinants of satisfaction in insurance and healthcare contexts. It encompasses policyholders' perceptions of the reliability, responsiveness, competence, and professionalism of insurance providers and affiliated healthcare institutions(Angelini, 2009). High service quality enhances user confidence,

reduces uncertainty, and promotes positive experiences throughout the insurance lifecycle. In health insurance systems, service quality extends beyond clinical care to include customer support, information clarity, provider networks, and grievance handling mechanisms.

Trust

Trust plays a central role in insurance relationships due to the inherent uncertainty and delayed benefits associated with insurance products. Policyholders must rely on insurance providers to fulfill contractual obligations, process claims fairly, and act transparently. Trust reflects confidence in the integrity, credibility, and ethical conduct of insurance institutions(Major & Hubbard, 2019)(Hassan & Salem, 2022)(Akmal et al., 2023). In environments characterized by information asymmetry and limited regulatory enforcement, trust becomes even more critical for sustaining participation in insurance schemes.

Premium Affordability

Premium affordability refers to the perceived reasonableness of insurance contributions relative to policyholders' income levels and expected benefits. In developing economies, where household incomes may be unstable, premium affordability significantly influences enrollment decisions and satisfaction levels. Affordable premiums reduce financial strain and enhance perceptions of value, while high or inflexible premiums may generate dissatisfaction and resistance to continued participation(Talha et al., 2025).

Claim Settlement Efficiency

Claim settlement efficiency captures the effectiveness of administrative processes related to reimbursement, approval, and dispute resolution. Timely and accurate claim settlement is essential for maintaining confidence in insurance systems. Delays, errors, or lack of communication during claim processing often lead to frustration and dissatisfaction among policyholders(Jiang et al., 2022). Efficient claim settlement not only improves satisfaction but also reinforces trust and perceived service quality.

Satisfaction

Satisfaction represents the aggregate assessment of policyholders' experiences with health insurance services. It reflects the extent to which expectations are met or exceeded across multiple dimensions, including service delivery, financial protection, and administrative support. High satisfaction levels are associated with positive behavioral outcomes such as policy renewal, loyalty, and positive word-of-mouth(Yang, 2006).

Research Methodology

Research Design

This study adopts a quantitative research design to examine the determinants of health insurance satisfaction using Partial Least Squares Structural Equation Modeling (PLS-SEM). The PLS-SEM approach is particularly suitable for prediction-oriented research, complex causal models, and situations involving latent constructs measured by multiple indicators.

Population and Sample

The target population comprised individuals enrolled in health insurance schemes and residing in Khartoum, Sudan. A structured questionnaire was distributed to 350 respondents using a convenience sampling technique. After data screening and validation, 318 responses were deemed suitable for analysis, resulting in a high response usability rate.

Table 1: Demographic Profile of Respondents. (n = 318)

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	186	58.5
	Female	132	41.5
Age Group (years)	Below 25	54	17.0
	25–34	98	30.8
	35–44	87	27.4
	45–54	52	16.4
	55 and above	27	8.5
Education Level	Secondary or below	61	19.2
	Undergraduate	143	45.0
	Postgraduate	114	35.8
Employment Status	Government sector	121	38.1
	Private sector	103	32.4
	Self-employed	56	17.6
	Unemployed/Other	38	11.9
Monthly Income	Low income	97	30.5
	Middle income	149	46.9
	High income	72	22.6
Type of Insurance	Public	181	56.9
	Private	137	43.1

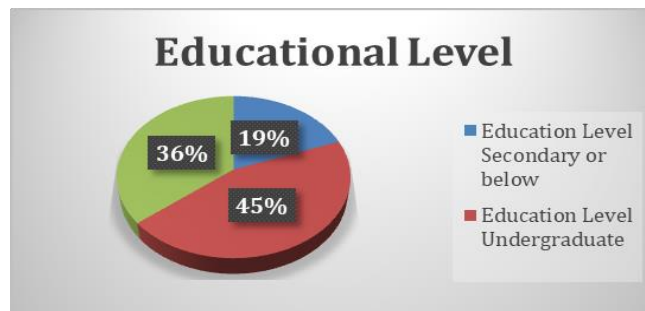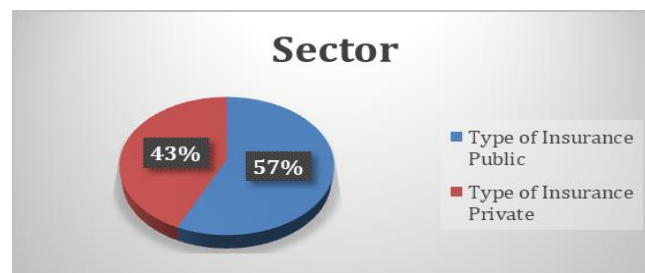**Fig:1 Gender.**

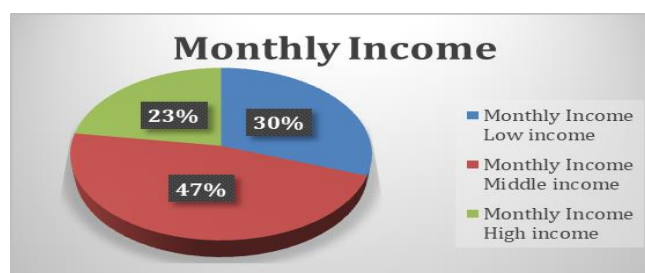**Fig 2: Age**

Fig 3:Employment Status.
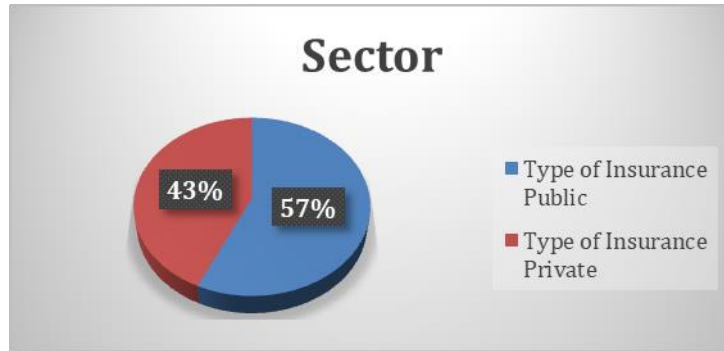

Fig 4: Monthly Income.

Fig 5: Sector

Measurement Instrument

The questionnaire was divided into two parts. The former section sought demographic data as above in figure 1 to 5 whilst the latter examined the five latent constructs, including the service quality, trust, premium affordability, claim settlement efficiency, and overall satisfaction. The measurement of each construct has involved the use of several items with five points Likert scale in which the strong disagreement to strong agreement is indicated.

Data Analysis Procedure

The analysis of data was based on two steps. At the outset, measurement model was measured to assess the reliability and validity such as internal consistency, convergent and discriminant validity. Secondly, structural model was analyzed to test the associations between constructs, to determine path coefficients and the explanation and predictive values of explanatory power.
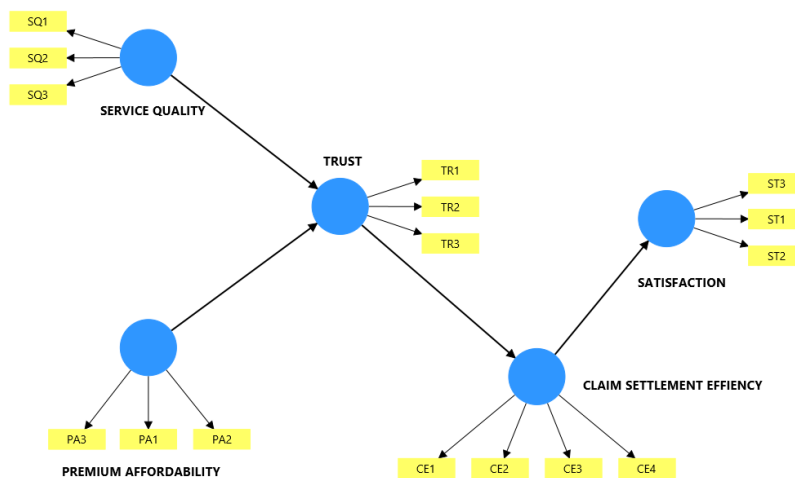
PLS-SEM Model

Fig 6: Created by Researchers
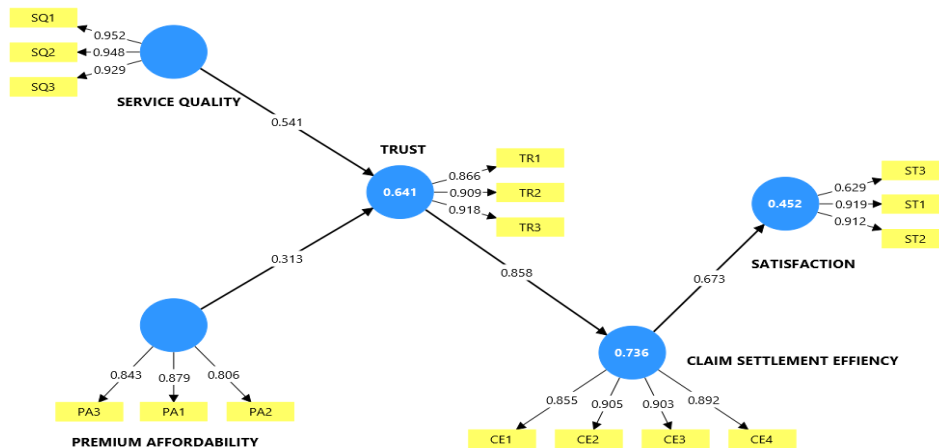
Analysis

Model Results

Fig 7: Results from PLS-SEM

Measurement Model Assessment

The measurement model was found to have an acceptable internal consistency and all constructs had good reliability. There were high enough indicator loadings, which showed that the observed variables were a good measure of their latent constructs. The acceptable levels of explained variance by the indicators were used to demonstrate convergent validity.

Discriminant validity was established, which held that the individual constructs measured a distinct part of health insurance satisfaction and was empirically differentiated with the rest of constructs. These findings suggest that the measurement model was strong and able to analyze the structure of the data.

Structural Model Assessment

The findings of the structural model showed that service quality had the most positive effect on health insurance satisfaction. More satisfied policyholders were those who felt that the quality of service is higher. The claim settlement efficiency also proved itself strongly positively affecting the role of timely and open administrative procedures.

Trust became a severe predictor of satisfaction that underlines the psychological aspect of insurance relations. Satisfaction was also positively related to premium affordability but this effect was relatively lower than that of service quality and efficiency in settlement of claims. On the whole, the model accounted a significant percentage of variance in health insurance satisfaction, which implies that the model has strong explanatory power.

Analysis (PLS-SEM Results)

The results of the PLS-SEM indicates an adequate and solid model that explains health insurance satisfaction among policyholders in Khartoum, Sudan. Measurement model demonstrates high levels of the reliability of the indicators with all outer loadings being higher than the recommended value of 0.70. The construct of Service Quality indicators are loaded very high (0.929-0.952) which is a great representation. On the same note, Trust, Premium Affordability, Claim Settlement Efficiency and Satisfaction are high in terms of the indicator loading and ascertains convergent validity.

The structural model also indicates that there are significant and statistically significant correlations among the constructs. The positive impact of Service Quality on Trust (0.541) is also significant and it could be assumed that the quality of service delivery has a strong positive influence on the level of trust of policyholders in insurance companies. Premium Affordability also has a positive impact on Trust (0.313), which means that affordable premiums result in the formation of trust.

Claim Settlement Efficiency is highly predicted by trust (= 0.858), which shows trust as an important mediating factor between service perceptions and administrative outcomes. In its turn, the Claim Settlement Efficiency positively, but insignificantly affects Satisfaction (0.673) thus proving that effective and prompt processing of claims is a primary factor of overall satisfaction.

The values of R 2 denote moderately high explanatory power, wherein Trust (0.641), Claim Settlement Efficiency (0.736), and Satisfaction (0.452) represent that a significant percentage of the variance in major endogenous variables is explained by the model. All in all, the findings support the predictive power and practical applicability of the suggested framework.

DISCUSSION

The results of this research indicate the significance of the service provision and administration effectiveness in the determination of the health insurance satisfaction in Sudan. The most powerful determinant was the service quality, which showed the focus of policyholders on accessibility, responsiveness, and professionalism. These results indicate that investment in improvement of the services can produce tremendous satisfaction returns. Another factor that was found to drive satisfaction is claim settlement efficiency, and this fact indicates the significance of the streamlined administrative procedures. Any delays or

inefficiencies in the processing of claims will destroy confidence and erode the perceived value of insurance cover. In this regard, insurance providers should focus on the enhancement of claim processing systems. The issue of trust was an important factor in satisfying people, which confirms the necessity of transparency, ethical behavior, and communication. In emerging economies, institutional trust can be low and therefore insurance providers need to work hard to establish and sustain trust in order to be involved in the long term. Although the premium affordability factor was not very powerful as compared to the other aspects, it was also of significant concern to the policyholders who were less affluent. The use of flexible premium designs and subsidies can make the insurance more affordable and satisfying.

CONCLUSION

The research gives detailed empirical data on the factors that can account health insurance satisfaction among policyholders in Khartoum, Sudan, by applying a Partial Least Squares Structural Equation Modeling (PLS-SEM) technique. It is evident that the results have shown that service quality, efficiency in settling claims, trust, and affordability of the premium has a major impact on overall satisfaction with health insurance schemes. The structural relations in the model bring out the interdependence of the functional service factors with psychological perceptions in the assessment of policyholders. Of the studied determinants, service quality and the efficiency of claim settlement were found to be the most significant determinants, and the importance of operational performance in insurance satisfaction can be highlighted.

The service quality effect is strong, which means that policyholders are of significant interest on the level of accessibility, responsiveness, professionalism, and clarity of insurance services. Contact that is efficient with insurance employees, access to healthcare providers, and prompt communication seems to drastically improve the value and reliability perceptions. The quality of the services offered by the high service rates does not only add to the satisfaction but also indirectly enhances the trust which supports the positive ratings of administrative processes as well. These results imply that frontline service delivery can be enhanced to create cascading benefit in various aspects of policyholder experience.

Claim settlement efficiency also proved to be an important factor determining satisfaction as it is a matter of sensitivity of policyholders to administrative efficiency and procedural fairness. Approving of claims on time, openness in reimbursement processes, and low levels of bureaucracy greatly contribute to the high levels of satisfaction. The interconnection

between trust and claim settlement efficiency is very high which shows that there are easier administrative relationships and less perceived uncertainty are shown by trust in insurance providers. Within the framework of the changing healthcare financing system in Sudan, effective management of claims is a concrete measure of the institutional reliability and credibility.

The mediating role of trust in the model was found to play a central role in the relationship between service quality and affordability of premiums and downstream outcomes. Trust demonstrates the confidence of the policyholders that the provider of insurance services will meet the promises, be ethical, and provide a stable supply of assistance when it is needed in healthcare. The findings indicate that trust does not arise alone but rather it is influenced by recurring experiences of service and the perception of justness in pricing schemes. The insurance companies that keep a high degree of transparency and responsibility are more prone to foster long-term trust which subsequently improves satisfaction and longer involvement.

Although premium affordability is not as significant a factor as the service quality and administrative efficiency, it is still a significant factor on the level of satisfaction, especially in a developing economy scenario. Affordable premiums, based on income and perceived value, will climb the financial burden and support value perceptions. Ease of payment and well-established benefit packages can be used to improve affordability perceptions and add to positive rating of insurance schemes.

In a more practical sense, the results provide useful advice to policy makers and insurers that aim to make health insurance systems in Sudan more effective and sustainable. The key changes in policyholder satisfaction can be achieved through strategic investments in the improvement of service quality, the digitalization of claim processing, and staff training. Also, the trust may be enhanced by regulatory frameworks that encourage transparency and accountability that can help more people participate in insurance programs.

Although it made some contributions, the study has some limitations that should be considered. The cross-sectional type of research does not allow drawing causal conclusions, and the research is focused on Khartoum, which makes it difficult to assert the application of the results in other areas. The suggested framework could be expanded to other geographic locations in the future, include longitudinal data to reflect the dynamic changes in

satisfaction, and observe other behavioral consequences including loyalty, renewal intentions, and patterns of healthcare usage. These extensions would also enhance the knowledge of performance of health insurance in the developing economies.

Scope and Further Research

The focus of the current research is based on the analysis of the most influential factors of health insurance satisfaction among policyholders in Khartoum, Sudan, and the application of PLS-SEM framework. The study creates an organised explanation of the functional and psychological factors interaction to create satisfaction in a setting with developing economies in the context of service quality, trust, premium affordability, and efficiency in claims settlement. The results are especially applicable in urban health insurance systems where the process of administration and the service delivery is a determining factor to the way policyholders perceive the influence of it.

Nevertheless, the study can be expanded in a number of directions that are important to the study. Future studies can take the model proposed in the study to other parts of Sudan to understand the geographic differences in the healthcare infrastructures, income, and insurance penetration rates. The comparison between urban and rural population might provide more information on the contextual differences in driving the satisfaction. Moreover, it might be beneficial to apply the framework to the performance and policy efficiency of the private and the public insurance scheme separately.

Longitudinal designs could also be used in future research that will investigate the dynamics of satisfaction over time in reaction to policy reforms, digitalization programs, or economic shifts. Furthermore, the model can be improved by adding more constructs like perceived value, service accessibility, healthcare quality, and policyholder loyalty to enhance the explanatory ability of the model. A further investigation of moderating variables (income, age, or health status) would contribute to a better comprehension of heterogeneous policyholder behavior.

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