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Analysis of the Impact of Mileage, Service Costs, and Availability of Medical Personnel on Patient Satisfaction in Accessing Health Services in Disadvantaged Areas in Indonesia

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ABSTRACT

This study examines the impact of distance travelled, cost of service, and availability of medical staff on patient satisfaction in accessing healthcare services in disadvantaged areas of Indonesia. Using a quantitative approach, data were collected from 50 respondents through a structured questionnaire, employing a Likert scale of 1-5. Multiple regression analysis was performed using SPSS version 26 to determine the relationships between the independent variables (distance travelled, cost of service, and availability of medical staff) and the dependent variable (patient satisfaction). The results indicate that distance travelled and cost of service have significant negative impacts on patient satisfaction, while the availability of medical staff positively influences satisfaction. These findings provide valuable insights for policymakers and healthcare providers in addressing the barriers to healthcare access in underserved regions of Indonesia and improving patient satisfaction.

Keywords: *Patient Satisfaction, Healthcare Access, Distance Travelled, Cost of Service, Availability of Medical Staff*

1. INTRODUCTION

Access to healthcare in Indonesia's rural and remote regions faces challenges such as geographic isolation, limited infrastructure, and a shortage of healthcare professionals. These barriers result in significant disparities in healthcare access and patient satisfaction. Economic barriers, including high deductibles and co-pays, particularly burden low-income individuals in rural areas [1], while structural issues like limited transportation and healthcare facilities further hinder access [1]. The uneven distribution of health facilities, concentrated on Java Island, leaves rural areas underserved [2], with poor infrastructure, such as inadequate road conditions, exacerbating the problem [2]. Socioeconomic factors are key predictors of healthcare use, revealing inequalities in access [3], while spatial disparities in healthcare accessibility highlight the need for targeted planning [1]. Improving access requires addressing socioeconomic, structural, and spatial factors through comprehensive strategies [1].

Patient satisfaction is a multifaceted measure of healthcare quality, influenced by factors such as medical service quality, communication, and the healthcare environment, all of which significantly affect healthcare experiences, particularly in disadvantaged areas. Research underscores the importance of qualified medical staff, effective communication, and accessible services in ensuring satisfactory healthcare experiences. The qualifications and readiness of medical staff are pivotal, with high-quality and timely care provided by well-trained professionals enhancing patient satisfaction [4]. The reliability and responsiveness of healthcare services also play a crucial role in meeting or exceeding patient expectations [5]. Effective communication between providers and patients is essential, managing expectations and improving overall experiences [6], while

empathy and reassurance from healthcare providers further influence satisfaction [5]. Additionally, the accessibility of healthcare facilities, particularly for disadvantaged populations, and the financial burden of medical services are key factors affecting satisfaction [4], [7].

The distance patients must travel to access healthcare services significantly impacts their satisfaction and health outcomes, particularly in rural and economically disadvantaged areas. Long travel distances can delay treatment, increase costs, and cause physical strain, all of which contribute to patient dissatisfaction. Additionally, the cost of healthcare services, including consultation fees, medications, and transportation, exacerbates these challenges. Patients in rural areas often face long journeys to access healthcare, which can delay treatment and increase mortality rates, as seen in heart failure patients living far from cardiology services [8]. In India, individuals with chronic conditions like cardiovascular diseases frequently travel outside their district for care, revealing local healthcare inadequacies [9]. Travel times to cancer treatment centers also vary significantly based on transportation mode and socioeconomic factors, with rural and deprived areas experiencing the longest travel times [10]. High healthcare costs, including transportation, are prohibitive for economically disadvantaged populations, reducing healthcare utilization and satisfaction [11]. In the United States, rural communities face additional barriers due to low income and inadequate insurance coverage, limiting access to essential services [9]. Improving spatial accessibility and equitable distribution of healthcare resources could reduce patient mobility and enhance satisfaction [12], while telehealth offers a promising alternative to reduce travel burdens and improve access in rural areas [9].

The availability of medical staff, including doctors, nurses, and other healthcare professionals, is crucial for ensuring effective healthcare delivery, especially in disadvantaged areas of Indonesia. The shortage of medical personnel in these regions exacerbates access challenges, resulting in long wait times, inadequate care, and reduced patient satisfaction. The presence of qualified and available medical staff is essential for timely and effective care, which directly influences patient satisfaction. Addressing this issue requires a multifaceted approach, involving workforce planning, infrastructure, and policy considerations. The Workload Indicator Staffing Need (WISN) method is an effective tool for analyzing and planning the distribution of health workers, as demonstrated in the Surakarta City Clinic, where there was an excess of general practitioners but a shortage of nurses [13]. In Southeast Sulawesi, the availability of health workers significantly impacted the utilization of health services, highlighting the need for strategic placement and workload analysis [14]. Disparities in health facility distribution, especially outside Java Island, coupled with infrastructural challenges like poor road conditions in Bandar Lampung, further hinder healthcare accessibility [15]. The adoption of Electronic Medical Records (EMR) has been suggested as a solution to improve healthcare quality, though challenges such as limited infrastructure and skilled professionals remain [14], [16]. Service quality is also a core focus for healthcare providers, integrated into strategic planning to maintain standards and improve patient satisfaction, despite rising costs [17].

Given the importance of these factors, this study seeks to analyze the impact of distance travelled, the cost of services, and the availability of medical staff on patient satisfaction in accessing health services in disadvantaged areas of Indonesia. By examining these key variables, the study aims to provide insights into the specific challenges faced by healthcare systems in underserved regions and to offer recommendations for improving patient satisfaction. The findings of this study

are expected to contribute to policy discussions on healthcare access and quality, ultimately helping to improve healthcare delivery in Indonesia's most vulnerable areas. This research adopts a quantitative approach, involving 50 participants from disadvantaged regions of Indonesia.

2. LITERATURE REVIEW

2.1 Patient Satisfaction in Healthcare

Patient satisfaction in healthcare is a complex, multidimensional construct influenced by factors such as care quality, communication, and the healthcare environment, and is further complicated in disadvantaged areas by limited access to services and resources. The quality of care, including the qualifications and readiness of medical staff, plays a crucial role in shaping positive patient experiences, as high-quality and timely medical services are essential [4], [18]. The healthcare environment, including the physical setting and available resources, also significantly affects patient satisfaction levels [4], [19]. Effective communication between healthcare providers and patients is a critical determinant of satisfaction, particularly in rural and remote areas where access to healthcare is limited, making clear and empathetic communication even more important [6]. Accessibility and affordability are vital components of patient satisfaction, but geographic and economic barriers in disadvantaged areas often impede access to adequate care [6]. Telehealth services have emerged as a promising solution, offering an alternative to in-person visits and improving patient satisfaction in areas with limited healthcare infrastructure [20].

2.2 Distance Travelled and Patient Satisfaction

Distance to healthcare services is a critical barrier to access, particularly in rural and disadvantaged areas, affecting patient satisfaction and outcomes. Longer travel distances result in decreased healthcare utilization and satisfaction, particularly in regions with limited infrastructure, where patients face additional burdens such as transportation costs and lost time. Unequal healthcare resource distribution leads to significant patient mobility, as seen in Italy, where many travel from southern to northern regions for better services [12]. In Australia, rural children with high-risk heart disease face substantial travel distances, highlighting the need for improved local services [21]. Temporal and spatial healthcare accessibility fluctuates in cities like Shanghai, where transit-based access varies, necessitating better strategies [22]. In the U.S., heart failure patients traveling long distances experience reduced follow-up care and higher mortality, emphasizing the need for telemedicine and local services [23]. Smartphone mobility data offers insights into healthcare access, allowing for more accurate assessments [24], while strengthening rural care can significantly improve outcomes [21].

2.3 Cost of Service and Patient Satisfaction

The cost of healthcare services significantly impacts patient satisfaction, particularly in disadvantaged areas where economic conditions are poor. High out-of-pocket expenses deter patients from seeking care, leading to dissatisfaction with the healthcare system. In developing countries like Indonesia, limited health insurance coverage exacerbates this issue, creating barriers to accessing quality services [25]. Financial

barriers, such as the inability to afford care, often result in delayed treatment and reduced health-seeking behavior, lowering patient satisfaction. Addressing these barriers through subsidies, health insurance schemes, and community-based financing can improve satisfaction. Financial burdens like high deductibles and co-pays disproportionately affect low-income individuals [1], while socioeconomic status and insurance gaps restrict access in the U.S. Hispanic community [26]. In Africa and Asia, financial capacity is a key determinant of healthcare access [27]. Community-based health insurance in Southern Ethiopia has improved satisfaction by reducing payment burdens [28], and affordability remains crucial for patient satisfaction across Asia (Akthar et al., 2023). Expanding insurance schemes and addressing barriers like transportation can further enhance access [1], [29].

2.4 Availability of Medical Staff and Patient Satisfaction

The availability of medical staff is crucial for ensuring high-quality healthcare services, especially in disadvantaged areas where shortages are common. These shortages lead to longer wait times, inadequate care, and limited access to specialized services, all of which negatively impact patient satisfaction. Addressing these shortages requires a multifaceted approach, including recruitment incentives, training programs, and retention strategies. In Health Professional Shortage Areas (HPSAs), a 5% reduction in medical office visits has been observed, particularly affecting older adults, Black individuals, and Medicaid beneficiaries, highlighting disparities in healthcare access [30]. The shortage of nursing staff is associated with increased medical errors and slower emergency response times, directly impacting patient satisfaction [31]. Effective strategies to mitigate staff shortages include active recruitment, retention efforts, and flexible work schedules [31], while attracting personnel to rural areas requires understanding healthcare workers' motivations and improving working conditions [9], [32]. Employee satisfaction, particularly related to compensation and work environment, plays a significant role in influencing patient satisfaction and care quality [33].

2.5 Healthcare Access in Disadvantaged Areas

Disadvantaged areas, particularly rural and remote regions, face significant challenges in providing adequate healthcare due to infrastructural, economic, and social barriers. In Indonesia, despite efforts like the National Health Insurance program (JKN), these challenges persist, especially in rural regions. Economic barriers, such as high deductibles and co-pays, make healthcare unaffordable for low-income individuals, while structural barriers like limited transportation and healthcare facilities exacerbate the issue [1]. In Bandar Lampung, disparities in health facility distribution and poor road conditions further hinder access [2]. Technological advancements, including big data and artificial intelligence, can help optimize healthcare delivery by efficiently allocating medical personnel, reducing urban-rural disparities [34]. Socioeconomic factors, cultural beliefs, and geographic isolation also limit access, as seen in rural Indonesia, where traditional healing practices and poverty worsen healthcare access issues [35]. Similar trends are observed in Australia, where rural areas experience greater health inequalities, highlighting the need for context-specific policies [36].

Conceptual Framework

Based on the literature, this study's conceptual framework examines the relationship between three independent variables—distance travelled, cost of service, and availability of medical staff—and the dependent variable, patient satisfaction. The framework posits that each of these factors plays a significant role in shaping patients' overall satisfaction with healthcare services in disadvantaged areas. By analyzing these relationships, the study seeks to provide insights into the factors that most significantly impact patient satisfaction and to offer recommendations for improving healthcare access and quality in underserved regions. While previous studies have extensively examined the relationship between healthcare accessibility and patient satisfaction, few have focused on the specific challenges faced by disadvantaged areas in Indonesia. Additionally, there is limited research that quantitatively analyzes the combined effect of distance travelled, cost of service, and availability of medical staff on patient satisfaction in these regions. This study seeks to fill this gap by conducting a comprehensive analysis of these factors in the context of disadvantaged areas in Indonesia, providing valuable insights for policymakers and healthcare providers.

3. METHODS

3.1 Research Design

This study employs a quantitative research design to analyze the relationships between three independent variables—distance travelled, cost of service, and availability of medical staff—and the dependent variable, patient satisfaction. Data was collected from patients in disadvantaged areas of Indonesia using a structured questionnaire with a Likert scale of 1-5, measuring perceptions of travel distance, service affordability, medical staff availability, and overall satisfaction with healthcare services. The quantitative approach was selected for its ability to generalize findings to the wider population and statistically analyze the strength and significance of the relationships between variables. This method provides a systematic investigation of the factors influencing patient satisfaction and offers insights into the challenges faced in accessing healthcare in disadvantaged areas.

3.2 Population and Sample

The population for this study consists of patients residing in disadvantaged areas of Indonesia, particularly in rural and remote regions where healthcare services are often limited. Disadvantaged areas in this context refer to regions with poor infrastructure, low socioeconomic status, and limited access to essential healthcare services.

A sample size of 50 respondents was selected using convenience sampling, a non-probability sampling technique. This method was chosen due to the practical challenges of reaching patients in remote areas and the limited resources available for conducting the study. Although the sample size is small, it is considered sufficient to provide initial insights into the factors influencing patient satisfaction in these areas. Future studies with larger sample sizes could build on the findings of this research.

3.3 Data Collection

Data collection was conducted using a structured questionnaire distributed to 50 patients in various disadvantaged areas of Indonesia. The questionnaires were administered face-to-face by trained data collectors to ensure clarity of questions and accurate data collection. Respondents were informed about the purpose of the study and assured of the confidentiality of their responses.

3.4 Data Analysis

Once the data were collected, they were coded and entered into SPSS version 26 for statistical analysis. The process began with descriptive statistics, such as mean, standard deviation, and frequency distributions, to summarize the respondents' demographic characteristics and provide an overview of the data for each variable (distance travelled, cost of service, availability of medical staff, and patient satisfaction). Reliability testing was conducted using Cronbach's alpha, where a value above 0.70 was deemed acceptable for internal consistency. The core analysis involved multiple regression to examine the relationships between the independent variables (distance travelled, cost of service, and availability of medical staff) and the dependent variable (patient satisfaction), assessing how much variance in patient satisfaction was explained by the independent variables. Assumption testing for normality, linearity, multicollinearity, and homoscedasticity was performed to validate the regression model. Finally, hypothesis testing was conducted at a significance level of $p < 0.05$ to determine whether each independent variable had a statistically significant effect on patient satisfaction.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

The descriptive statistics provide an overview of the demographic characteristics of the sample and summarize responses for each variable. The sample consisted of 50 respondents from disadvantaged areas in Indonesia, with 58% female and 42% male. Most respondents (66%) were aged 30 to 50, and 54% had secondary education. Regarding healthcare access, 72% of participants agreed or strongly agreed that they had to travel long distances, with a mean score of 4.12, indicating that distance is a major concern. On healthcare costs, 68% felt services were unaffordable, with a mean score of 3.85, reflecting the financial burden faced by patients. In terms of medical staff availability, 60% disagreed or strongly disagreed that there were enough healthcare professionals, with a mean score of 2.95, pointing to a shortage of staff. Finally, patient satisfaction was moderate, with a mean score of 3.45, and 52% of respondents expressed dissatisfaction, highlighting areas for improvement in healthcare services in these regions.

4.2 Reliability Analysis

A Cronbach's alpha test was conducted to assess the reliability and internal consistency of the items in the questionnaire. The results showed that all variables demonstrated acceptable reliability, with Cronbach's alpha values above 0.70. Specifically, the scores were as follows: distance travelled (0.783), cost of service (0.828), availability of medical staff (0.762), and patient satisfaction (0.814). These values indicate that the items measuring each construct were internally consistent.

4.3 Multiple Regression Analysis

A multiple regression analysis was conducted to examine the relationship between the independent variables (distance travelled, cost of service, and availability of medical staff) and the dependent variable (patient satisfaction). The results of the regression analysis are presented in Table 1 below.

Table 1. Multiple Regression

Variable	Beta Coefficient	t-value	p-value
Distance Travelled	-0.42	-2.98	0.005**
Cost of Service	-0.37	-2.45	0.018*
Availability of Medical Staff	0.53	3.65	0.001**
R-squared	0.64		
Adjusted R-squared	0.61		

The regression model has an R-squared value of 0.64, indicating that 64% of the variance in patient satisfaction can be explained by the three independent variables, with an adjusted R-squared value of 0.61 supporting the model's predictive power. All three independent variables were found to have a statistically significant impact on patient satisfaction. Distance travelled (Beta = -0.42, p = 0.005) showed a negative association, meaning longer travel distances resulted in lower satisfaction, supporting H1, which aligns with previous research on geographic barriers (Kelly et al., 2016). The cost of service (Beta = -0.37, p = 0.018) also had a negative impact, supporting H2, consistent with studies by Witter et al. (2016) highlighting financial barriers to healthcare access. The availability of medical staff (Beta = 0.53, p = 0.001) had a strong positive effect on patient satisfaction, supporting H3, in line with Wilson et al. (2009), emphasizing the importance of healthcare worker availability.

Discussion

The results of the regression analysis provide several important insights into the factors that influence patient satisfaction in accessing healthcare services in disadvantaged areas of Indonesia. The significant relationships between the independent variables and patient satisfaction highlight key areas that need to be addressed to improve healthcare access and service delivery in these regions.

The Impact of Distance Travelled on Patient Satisfaction

The negative relationship between distance travelled and patient satisfaction is consistent with the challenges faced by patients in rural and remote areas, where healthcare facilities are often located far from residential communities. Long travel distances increase transportation costs, travel time, and physical strain, all of which negatively impact patients' healthcare experiences [8], [10], [37]. This finding underscores the need for interventions to reduce geographic barriers to healthcare access, such as the establishment of more localized health clinics, mobile health services, and telemedicine solutions. Policies aimed at improving transportation infrastructure and reducing travel burdens can also play a significant role in enhancing patient satisfaction in disadvantaged areas.

The Impact of Cost of Service on Patient Satisfaction

The negative association between the cost of healthcare services and patient satisfaction highlights the financial challenges faced by patients in disadvantaged areas. High out-of-pocket healthcare costs, coupled with low income levels, create significant barriers to healthcare access[1], [38], [39]. Patients who are unable to afford healthcare services are more likely to delay or avoid seeking medical attention, leading to dissatisfaction. This finding suggests that efforts to reduce healthcare costs through subsidies, health insurance schemes, and community-based financing could improve patient satisfaction and healthcare utilization in these regions.

The Impact of Availability of Medical Staff on Patient Satisfaction

The positive relationship between the availability of medical staff and patient satisfaction emphasizes the critical role that healthcare professionals play in ensuring patient satisfaction. In disadvantaged areas, the shortage of healthcare personnel often leads to long waiting times [4], [30], [40], inadequate care, and patient frustration. Addressing the shortage of healthcare staff through recruitment incentives, training programs, and retention strategies is essential to improving patient satisfaction. Policies that support the deployment of healthcare professionals to rural areas and enhance their working conditions can help bridge the gap in healthcare access and improve patient experiences.

CONCLUSION

This study highlights the significant challenges faced by patients in disadvantaged areas of Indonesia when accessing healthcare services. The findings reveal that long travel distances and high costs of healthcare negatively impact patient satisfaction, while the availability of medical staff plays a critical role in enhancing satisfaction. These results emphasize the need for targeted interventions to reduce geographic and financial barriers, such as expanding local healthcare facilities, implementing telemedicine solutions, and offering financial support or health insurance schemes. Furthermore, efforts to increase the availability of healthcare personnel in rural and remote areas through recruitment incentives and improved working conditions can significantly improve patient satisfaction. Overall, this research provides practical recommendations for improving healthcare delivery in underserved regions, contributing to ongoing efforts to promote equitable access to quality healthcare across Indonesia.

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