Mobile JKN as an Application to Improve Service Quality of Social Security Administration Agency for Health in Hemodialysis Unit

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ABSTRACT

Digital transformation in healthcare services is a major focus of *BPJS Kesehatan* (Social Security Administration Agency for Health) through the Mobile JKN application. This study aimed to evaluate the quality of BPJS services using Mobile JKN in the Hemodialysis Unit of Dr. Pirngadi Regional General Hospital in Medan, using a mixed methods approach (quantitative and qualitative). The quantitative method was conducted by distributing questionnaires to 109 patients who use Mobile JKN. The results showed that the aspect of ease of access scored an average of 3.72, service speed 4.0, application features 3.35, and patient satisfaction 3.77. These findings indicate that the majority of patients feel helped by the existence of Mobile JKN, especially in terms of queue efficiency and ease of administration. However, there are still obstacles such as limited digital literacy, technical difficulties in logging in, and low utilization of additional features such as changing health facilities and online consultations. In-depth interviews supported the quantitative data, in which most elderly respondents experienced difficulties in using the application without assistance. *BPJS Kesehatan* officers and medical personnel play an important role in assisting the application usage process. It can be concluded that Mobile JKN has significantly improved *BPJS Kesehatan* services, but optimizing its utilization still requires improvements in education and assistance as well as technical system improvements.
Keywords: digital health services; hemodialysis unit; service quality

INTRODUCTION

Healthcare is one of the basic rights guaranteed by the constitution and must be fulfilled by the government for all Indonesian citizens without exception. One of the efforts to fulfill this right is through the "*Jaminan Kesehatan Nasional / JKN*" (National Health Insurance Program) managed by the "*Badan Penyelenggara Jaminan Sosial* (BPJS) *Kesehatan*" (Social Security Administration Agency for Health).[1] This program has a vision to expand access to easy, fair, and quality health services for the community. With its broad coverage, JKN is an important instrument in national health development, including for patients with chronic conditions who require long-term care, such as kidney failure patients who must undergo regular hemodialysis therapy.[2]

Hemodialysis is an essential renal replacement therapy for patients with advanced chronic kidney disease.[3] Healthcare is one of the basic rights guaranteed by the constitution and must be fulfilled by the government for all Indonesian citizens without exception. One of the efforts to fulfill this right is through the JKN managed by the BPJS. This program has a vision to expand access to easy, fair, and quality health services for the community.[4] With its broad coverage, JKN is an important instrument in national health development, including for patients with chronic conditions who require long-term care, such as kidney failure patients who must undergo regular hemodialysis therapy.[5]

Faced with these challenges, BPJS launched an innovation in the form of a digital service application called Mobile JKN. This application allows BPJS participants to access various services online, from service registration and membership status checks to speeding up administrative processes at hospitals.[6] The Mobile JKN application is expected to support the efficiency of health services, especially for hemodialysis patients who need certainty in their routine and regular service schedules.[7] However, the implementation of the Mobile JKN application in the field has not always gone as expected. Previous studies have shown that the utilization rate of this application is still relatively low. Many participants have not optimally utilized the available features, either due to limited digital literacy, technical constraints, or a lack of socialization from relevant parties.[8] This condition is particularly critical for hemodialysis patients, as delays or failures in obtaining therapy schedules can threaten the safety of patients' lives.[9] Hemodialysis patients require routine therapy 2-3 times per week, and delays in scheduling can cause toxin buildup in the body, pulmonary edema, hyperkalemia, and other fatal complications. Therefore, the efficiency of the administrative system and schedule certainty are vital factors that cannot be ignored. In the hemodialysis unit at Dr. Pirngadi Regional General Hospital, this application is expected to help BPJS patients manage their therapy schedules, reduce waiting times, and increase patient satisfaction with the services provided. However, evaluations of the effectiveness and efficiency of Mobile JKN in this unit are rarely conducted, so there is no comprehensive information about its impact on the quality of services in the hemodialysis unit.

Based on the above background, this study aimed to evaluate BPJS services through the Mobile JKN application in the hemodialysis unit of Dr. Pirngadi Regional General Hospital in Medan. This study focuses on assessing the extent to which the Mobile JKN application helps improve service quality, identifying obstacles encountered in its implementation, and providing recommendations for improvement to optimize the use of this application in the future. Thus, the results of this study are expected to contribute to improving the efficiency and quality of health services for BPJS patients at Dr. Pirngadi Regional General Hospital, especially for those who require routine hemodialysis treatment.

METHODS

This study was conducted from April to June 2025 at the Hemodialysis Unit of Dr. Pirngadi Regional General Hospital in Medan, which is the main referral hospital for BPJS patients with chronic kidney disease. Given the relevance of the issues raised, this study used a mixed methods approach with an exploratory sequential design. This design was implemented in two sequential stages: the first stage used a qualitative approach through in-depth interviews to explore experiences and perceptions related to the use of Mobile JKN, followed by a quantitative stage through a questionnaire survey to measure and quantify qualitative findings in a larger sample. This phased approach was chosen to obtain a comprehensive and in-depth understanding of the phenomenon of Mobile JKN usage.

The main population of this study was BPJS patients in the hemodialysis unit of Dr. Pirngadi Regional General Hospital who used the Mobile JKN application. Based on administrative data, there were approximately 250 hemodialysis patients per year, with 150 patients being active users of the Mobile JKN application. The sampling technique used purposive sampling with the following inclusion criteria: (1) BPJS patients who were actively undergoing hemodialysis at Dr. Pirngadi Regional General Hospital, (2) had used the Mobile JKN application for at least 3 months, (3) were 18 years of age or older, and (4) were willing to participate in the study. Exclusion criteria included: (1) patients with severe cognitive impairment, (2) patients who could not communicate well, and (3) patients who refused to give informed consent. Based on these criteria, a sample of 109 patients was obtained for the quantitative stage and 10 informants (5 patients, 3 medical personnel, 2 administrative staff) for the qualitative stage.

Data collection was conducted using three main instruments, namely semi-structured interviews, structured questionnaires, and documentation. The collected data were analyzed using thematic analysis with the stages of open coding, categorization, and theme extraction from the interview results. Quantitative data were analyzed using descriptive statistics (frequency, percentage, mean) with the help of SPSS software. The results of the two stages were then integrated through triangulation techniques to provide a comprehensive picture of the patterns of use and patient perceptions of Mobile JKN. Meanwhile, the validity of the instruments was conducted through content validation by experts and a pilot test on 30 respondents. The reliability of the questionnaire was tested using Cronbach's Alpha with a value >0.7, indicating good internal consistency. Data triangulation was performed between qualitative, quantitative, and documentation results to improve the accuracy of the research results.

This study has obtained ethical approval from the Health Research Ethics Committee of Prima Indonesia University Number: 081/KEPK/UNPRI/V/2025. Informed consent was given to all respondents by guaranteeing confidentiality and voluntary participation. Data was stored using a coding system and was only used for the purposes of this study.

RESULTS

As one of the city and provincial referral hospitals, RSUD Dr. Pirngadi Medan City has an important role in providing comprehensive health services to the community, including patients with chronic diseases that require continuous therapy. One of the vital service units in this hospital is the Hemodialysis Unit, which functions to treat patients with chronic kidney disease through routine blood cleansing procedures. The majority of patients served in this unit are BPJS Health participants, so the continuity of services is greatly influenced by the effectiveness of the JKN system in ensuring access, certainty, and quality of health services.

In recent years, to support the smoothness and efficiency of patient administration services, the hospital has utilized digital innovation in the form of the Mobile JKN application. This application not only aims to speed up the administrative process, but also becomes an important instrument in improving service quality through faster access to information, more structured schedule arrangements, and transparency in service procedures. Thus, the integration of Mobile JKN in the service system at the Hemodialysis Unit of RSUD Dr. Pirngadi Medan City is expected to be able to answer the challenges of increasing the number of patients while supporting digital transformation efforts in the health sector.

Tabel 1. Distribution of demographic characteristics of patients at Hemodialysis Unit of Dr. Pirngadi Regional General Hospital in Medan in 2025

Demographic variable	Category	Frequency	Percentage
Gender	Male	62	56.90
	Female	47	43.10
Age	>50 years	72	66.10
	≤50 years	37	33.90
Education	Junior high school	2	1.80
	Senior high school	78	71.60
	Diploma	6	5.50
	Bachelor/Magister	23	21.10
Use of the Mobile JKN	≥6 months	80	73.40
	<6 months	29	26.60

Based on Table 1, the majority of respondents were male (56.9%), indicating higher male participation in the study. This may reflect the gender distribution of service users or survey participants at Dr. Pirngadi Hospital. In terms of age, most respondents were over 50 years old (66.1%), suggesting that the services studied, such as the Mobile JKN application are predominantly utilized by older individuals who may require healthcare services more frequently. Regarding education, the largest group of respondents had completed senior high school (71.6%). This indicates that the Mobile JKN application is primarily accessed by users with a high school education background. In terms of Mobile JKN usage, the majority of respondents (73.4%) had used the application for six

months or longer. This suggests that most users had sufficient experience with the app, which may influence their evaluation of its service quality.

Tabel 2. The results of patient response to Mobile JKN at Hemodialysis Unit of Dr. Pirngadi Regional General Hospital in Medan in 2025

Variable	Minimum	Maximum	Mean	Standard deviation	Category
Ease of access (X_1)	2.00	5.00	3.72	± 0.63	Good
Service speed (X_2)	2.80	5.00	4.00	± 0.57	Good
Application features (X_3)	1.80	4.60	3.35	± 0.72	Fair
Patient satisfaction (Y)	2.60	4.80	3.77	± 0.61	Good

Based on the research findings (Table 2), the service speed variable (X_2) recorded the highest mean score of 4.00 and the lowest standard deviation of ±0.57, indicating a positive and consistent perception among the majority of respondents. The utilization of application features (X_3) fell into the "sufficient" category with a mean score of 3.35, suggesting that users experienced certain obstacles or limitations when accessing features within the Mobile JKN application. This represents a critical area for improvement. The patient satisfaction variable (Y) was rated in the "good" category with a mean score of 3.77, reflecting that overall services provided through the Mobile JKN application meet patient expectations, although there remains room for enhancement. Similarly, the ease of access variable (X_1) also received a "good" rating with an average score of 3.72, indicating that users generally found the application fairly easy to access. However, the presence of a minimum score of 2.00 suggests that not all respondents shared the same level of satisfaction.

In general, Mobile JKN services received a positive response, especially in terms of service speed and ease of access. However, utilization of application features is still in the moderate category, indicating the need for improvements in design, functionality, or education on the use of features so that users can utilize the application more optimally. Improvement efforts in this area could potentially boost overall patient satisfaction.

Table 3 shows the types of barriers experienced by respondents in using the Mobile JKN application. The most common barrier experienced was not understanding the application features (41.3), followed by difficulty logging in or forgetting passwords (34.8), and applications that often experience errors (26.6). This data indicates that aspects of digital literacy and application stability are still the main challenges in the utilization of digital services by respondents.

Table 3. Types of barriers to patients' use of the Mobile JKN application

Type of barrier	Frequency	Percentage
Difficulty logging in / forgotten password	38	34,80
Frequent application errors	29	26,60
Lack of understanding of application features	42	41,30

In qualitative research, this study involved ten informants who were purposively selected based on their direct engagement with the Mobile JKN application in the Hemodialysis Unit of Dr. Pirngadi Regional General Hospital. The informants represented a diverse group: five hemodialysis patients aged between 45 and 67 years who actively used the Mobile JKN application, three medical personnel consisting of one physician and two nurses with professional experience ranging from five to twelve years, and two BPJS administrative officers responsible for direct patient services. The selection of these informants was intended to capture a comprehensive and multidimensional perspective from all parties involved in the implementation and use of Mobile JKN.

The data collected through in-depth interviews were analyzed using a thematic analysis approach. This process involved several stages, including open coding, axial categorization, and theme selection. Through this rigorous analytical framework, six major themes emerged, each reflecting the informants' experiences and perceptions regarding the use of the Mobile JKN application in the context of hemodialysis services.

The findings revealed that the Mobile JKN application had a notably positive impact on the efficiency of service delivery. All informants; patients, medical personnel, and administrative staff—consistently acknowledged improvements in the speed and convenience of administrative procedures. Patients expressed particular appreciation for the online queue feature, which allowed them to register from home and avoid arriving at the hospital in the early morning hours. This sentiment was echoed by medical personnel, who observed a significant reduction in patient congestion at the registration area, attributing it to the widespread adoption of the digital queue system.

Despite these advantages, the implementation of the application was not without its challenges. One of the most prominent issues was the limited digital literacy among users, especially elderly patients. Many of them required ongoing assistance to operate the application. A 67-year-old patient candidly shared that he often relied on his child to help navigate the app, as he did not fully understand how it worked. Medical personnel confirmed that most hemodialysis patients, being older adults, were unfamiliar with mobile technology and needed personalized guidance to use the application effectively.

Another concern raised during the interviews was the limited utilization of the application's features. Although Mobile JKN offers a range of functions to support healthcare services, most patients only used the online queue feature. Other features; such as changing healthcare facilities, accessing online consultations, or retrieving health-related information were rarely explored. This underutilization was attributed to a lack of awareness about the existence and purpose of these features, as well as insufficient outreach and education from BPJS.

Technical barriers also emerged as a recurring theme. Users frequently reported issues such as application errors, login difficulties, forgotten passwords, and unstable internet connections. These problems not only hindered optimal use of the application but also added to the workload of administrative staff, who were often approached by patients seeking help to resolve these technical challenges.

The role of health and administrative personnel proved to be crucial in supporting patients' use of the application. Nearly all medical staff interviewed stated that they routinely assisted patients who struggled with the app. Although this support was offered voluntarily, some staff members suggested that it would be more effective to assign dedicated personnel to handle information technology concerns, allowing medical professionals to focus on clinical care.

Regarding education and outreach, the study found that BPJS's efforts to socialize and train users on the application were still lacking. While some educational activities had been conducted, they were neither regular nor systematic. Patients often learned how to use the application through informal channels; such as fellow patients or health workers rather than directly from BPJS staff. This situation underscores the need for a more structured and consistent socialization and training program to ensure that all features of the Mobile JKN application are understood and utilized effectively.

Table 4. Triangulation of quantitative and qualitative data

Quantitative findings	Qualitative confirmation
High patient satisfaction with service speed (mean = 4.0)	*"Very helpful, can queue online from home" (P1)*
41.3% of patients do not understand the application features	*"Online queue. Other features are not yet understood" (P3)*
34.8% experience difficulties logging in/forgetting passwords	*"Sometimes there are errors, or the network is weak. I often forget my password too" (P2)*
The app features were rated as "adequate" (mean 3.35)	*"Other features are not widely used" (B1)*

The qualitative findings reinforce and explain the quantitative results, showing that although Mobile JKN provides significant benefits in service efficiency, there are still obstacles that require intervention in the form of increased user education, technical system improvements, and the addition of dedicated support staff (Table 4).

DISCUSSION

Based on research conducted by investigators at Dr. Pirngadi Regional General Hospital in the Hemodialysis Unit, the implementation of the Mobile JKN application has demonstrated a positive impact on service quality. This is particularly evident in the dimension of service speed, which achieved the highest average score (4.00 ± 0.57), and in overall patient satisfaction, which was rated in the "good" category (3.77 ± 0.61). These quantitative findings were reinforced by qualitative data, with all informants acknowledging the application's role in improving service efficiency, especially through the online queuing feature that enables patients to register from home, eliminating the need to arrive early at the hospital. This finding affirms that the digitization of health services can enhance operational efficiency, aligning with prior research,[10] which states that digital transformation in the JKN era significantly improves service efficiency, particularly by reducing waiting times and expanding access for patients with chronic conditions.

The success observed in the service speed dimension can be interpreted through the lens of service quality in digital health contexts. Hemodialysis patients, who require regular and scheduled therapy, benefit directly from the online queue feature, which allows for more effective time management. This aligns with Situmorang's (2022) research,[11] which found that the Mobile JKN application enhances the effectiveness of BPJS insurance services by reducing waiting times and facilitating access to information. As one respondent expressed, "Very helpful, can queue online from home, no need to come early in the morning to the hospital," reflecting the positive influence of technology on the quality of life for chronic disease patients. This is further supported by findings from,[12] which identified a positive correlation between patient satisfaction among BPJS participants and the online registration system provided by the Mobile JKN application.

However, research conducted in the Hemodialysis Unit of Dr. Pirngadi Hospital also revealed a more nuanced and complex picture of digital health technology implementation within the Indonesian healthcare system. Despite high levels of satisfaction, the utilization of application features remained moderate (3.35 ± 0.72). Notably, 41.3% of respondents reported not understanding the available features, and 34.8% experienced technical issues such as forgotten passwords or system errors. Qualitative data indicated that most patients, particularly elderly individuals used only the online queue feature and were unaware of other functionalities. This paradox of high service speed but limited feature utilization suggests a significant digital divide among patients with specific demographic characteristics. Supporting data showed that 66.1% of respondents were over 50 years old and 71.6% had a high school education, both of which are associated with lower levels of digital literacy. This was echoed in qualitative responses such as, "I only know the online queue, other features I don't know." These findings are consistent with prior research,[13] which identified a negative correlation between advanced age and digital literacy in using the Mobile JKN application. Further studies emphasize that elderly users face substantial challenges in adopting digital health technologies due to limited understanding of interfaces and application functions.

These discrepancies can be further explained using the Technology Acceptance Model (TAM) and Rogers' Diffusion of Innovation Theory, which suggest that older adults tend to be late adopters and require more intensive support. Research by[14] similarly found a negative correlation between elderly age and digital literacy in Mobile JKN usage, while[15] identified age and education level as significant predictors of feature utilization. Van Dijk's concept of tiered access and Hargittai's second-level digital divide provide additional insight, indicating that while patients may have motivational and material access, their skill-based and usage access remains limited.

Barriers to implementation and implications for health equity emerged across three main categories: lack of understanding of features (41.3%), login difficulties (34.8%), and application instability (26.6%). These technical barriers highlight the importance of system reliability and user-friendly interface design, as emphasized by Rachmawati.[16] Qualitative data revealed that elderly patients often rely on family members for assistance, as one respondent noted, "My son often helps me because I don't really understand how it works." This reflects a

gap between technological design and real-world implementation, where systems intended to enhance efficiency may inadvertently increase the workload for healthcare staff who must assist patients.

From a health equity perspective, when technology designed to improve access instead creates barriers for certain groups, the goal of equitable access becomes counterproductive. The digital divide in healthcare carries more serious implications than in other sectors, as it directly affects the fundamental right to health. Other research[17] underscores that such gaps can lead to inequities in healthcare access, a concern echoed in the Indonesian Ministry of Health's (2021) Guidelines for the Implementation of Digital Transformation of Healthcare Services. An international study[18] also indicate that while national health applications improve accessibility, digital divides remain a significant challenge for vulnerable populations.

The implications of this paradox call for a more holistic approach to health technology implementation. Providing technological infrastructure alone is insufficient; it must be accompanied by digital literacy empowerment strategies tailored to user demographics. Practical recommendations include developing literacy programs specific to age and education profiles, redesigning user interfaces based on universal design principles, and establishing multi-layered support systems such as dedicated IT personnel, digital helpdesks, and peer-support initiatives. Enhancing features for chronic disease patients, such as therapy schedule reminders or quick-access consultations should also be prioritized. These strategies align with a finding,[15] which emphasize that digital literacy significantly affects the effectiveness of Mobile JKN usage and that a systematic approach is essential to overcoming barriers, particularly among socio-demographically vulnerable populations.

The analysis of barriers to Mobile JKN usage further reinforces these conclusions. The three dominant categories, incomprehension of features (41.3%), login difficulties (34.8%), and application instability (26.6%) reflect the complexity of implementing technology in a healthcare system serving diverse populations. The most prevalent barrier, lack of feature comprehension, is particularly concerning from a health equity standpoint. When technology intended to facilitate access instead creates obstacles, it undermines the principle of equitable healthcare. As one elderly respondent shared, "My son often helps me because I don't really understand how it works." This aligns with a findings,[19] which concluded that digital literacy levels significantly influence the effectiveness of Mobile JKN usage, especially among elderly individuals with lower-middle-class educational backgrounds.

This phenomenon illustrates that health technology implementation cannot be divorced from the socio-cultural context of the population it serves. From a public health perspective, technology should function as an enabler that strengthens service systems, not as a disabler that introduces new disparities. Therefore, implementation strategies must be sensitive to the characteristics of the target population and include adequate support mechanisms.

Although quantitative data placed patient satisfaction in the "good" category (3.77 ± 0.61), qualitative findings revealed more nuanced insights into user experience. This integration of data shows that satisfaction does not always correlate with optimal feature utilization. While this study contributes to a deeper understanding of Mobile JKN implementation, its findings carry important implications for the development of inclusive digital healthcare models. Such models must account not only for technological factors but also for human, social, and organizational dimensions. In the context of hemodialysis units, where patients are chronic disease sufferers requiring long-term therapy, technology implementation must be tailored to their specific needs and capacities. As emphasized by[20,21] a mixed-methods approach to evaluating digital health services provides a more comprehensive understanding of the complexities involved, particularly in identifying gaps between user perceptions and actual feature utilization.

CONCLUSION

The mixed methods research revealed that the Mobile JKN application has positively contributed to the quality of hemodialysis services at Dr. Pirngadi Hospital, particularly by improving service speed and patient satisfaction. The online queue feature emerged as the most beneficial, offering patients greater convenience and reducing waiting times. However, the overall utilization of the application remains limited due to challenges such as low digital literacy, lack of structured education and outreach from BPJS, and recurring technical issues. Elderly patients, in particular, often require assistance and tend to use only basic features. While medical and administrative staff have stepped in to support users, this has increased their workload. To fully realize the potential of Mobile JKN, a more comprehensive strategy is needed, one that includes targeted user education, improved system reliability, consistent socialization efforts, and dedicated IT support to ensure equitable access and usability for all patient groups.

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