

# Effectiveness of health services through the mobile-JKN application for the elderly: A case study at the Gunung Tua BPJS health office, North Sumatra

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## ARTICLE INFO

### Article history:

Received Feb 4, 2026

Revised Feb 11, 2026

Accepted Feb 16, 2026

### Keywords:

BPJS Health Insurance

Elderly

Mobile-JKN

Service Effectiveness

## ABSTRACT

This study aims to analyze the effectiveness of healthcare services delivered through the Mobile JKN application for elderly participants at the BPJS Kesehatan Gunung Tua Office, North Padang Lawas Regency. A descriptive qualitative approach was applied, with data collected through interviews, observations, and literature review. The findings indicate that the utilization of Mobile JKN among the elderly has not yet reached an optimal level due to low digital literacy, limited smartphone ownership, unstable internet access, and difficulties in using application features. Family support plays a crucial role in improving service effectiveness, particularly through assistance from children or grandchildren in accessing digital services. Based on the SERVQUAL dimensions, Mobile JKN shows adequate reliability and empathy but still requires improvement in interface simplicity, responsiveness, and accessibility for elderly users. Overall, Mobile JKN has strong potential to enhance healthcare service efficiency if supported by continuous socialization, digital literacy strengthening, improved infrastructure, and family-based assistance.

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## INTRODUCTION

Mastery of Information and Communication Technology (ICT) has become a key factor in the success of businesses and organizations in increasingly fierce global competition. The use of ICT in the workplace is no longer merely an option, but a necessity for achieving competitive advantage. Adapting to dynamic technological developments is key. This transformation has also transformed the health insurance sector, driving a revolutionary shift from conventional service systems to modern and efficient electronic systems (Kementerian Kesehatan Republik Indonesia, 2020).

The government is committed to improving public health through social security, a form of social protection that ensures the fulfillment of citizens' basic needs. This health insurance journey began with programs such as Jamkesmas (National Health Insurance), Jamkesda (Regional Health Insurance), and Askes (Health Insurance), which were later transformed into the Social Security

Administering Body (BPJS) under Law Number 24 of 2011. BPJS Kesehatan (Healthcare and Employment Insurance) and BPJS Ketenagakerjaan (Employment Insurance) were also established, with the National Health Insurance (JKN) as BPJS Kesehatan's flagship program, launched on January 1, 2014. JKN, an integral part of the National Social Security System (SJSN), is mandatory health insurance under Law Number 40 of 2004. Its goal is to ensure all Indonesians have access to adequate healthcare. BPJS Kesehatan (Healthcare and Social Security Agency) consistently strives to provide excellent service, including providing information, and adapting to technological developments. For example, the JKN mobile application was launched to improve services for JKN-KIS participants (BPJS Kesehatan, 2017).

The JKN Mobile Application represents a digital transformation of BPJS Kesehatan's business model, transforming administrative activities from branch offices or health facilities into an application that can be used by participants anywhere and anytime without restrictions. The JKN mobile application was launched by BPJS Kesehatan President Director Fachmi Idris in Jakarta on November 16, 2017, in the presence of the Minister of Communication and Informatics of the Republic of Indonesia, Rudiantara. The JKN mobile application is designed to provide easy access for participants, from premium payments and changes to membership data, to billing information, family data, nearby health facilities, and complaint channels. The goal is to reduce long queues at BPJS Kesehatan branch offices, freeing up participants' time for more productive activities. Now, BPJS Kesehatan administrative matters can be completed easily and flexibly, anytime and anywhere, directly through a smartphone (Kementerian Komunikasi dan Informatika Republik Indonesia, 2017).

Despite the many conveniences offered by the mobile JKN application, many JKN participants have not yet fully utilized it. This is due to several factors, including low digital literacy among the public and limited internet access in some areas. A more significant factor among the people of North Padang Lawas Regency is the large number of people who still do not own or use smartphones. One of the requirements for registering for BPJS is bringing a smartphone along with an active mobile phone number with at least Rp. 5,000 in credit, so that the OTP code for BPJS registration is received via smartphone notification (Wulandary, R., & Ikhsan, 2019).

Empirical gaps in rural contexts such as North Padang Lawas include the limited focus on elderly users in rural areas, as most Mobile JKN studies are conducted in urban settings. There is also a lack of micro-level empirical evidence on the digital divide, particularly regarding smartphone ownership, digital literacy, and internet instability. In addition, family-assisted usage, which plays a crucial role in rural elderly populations, has not been systematically measured as a determinant of service effectiveness. Furthermore, context-sensitive evaluations of digital service quality and comparative or longitudinal studies between rural and urban areas remain limited.

This research contributes to the literature on the effectiveness of digital-based health services in several important ways.

First, it adds empirical evidence from a vulnerable user group, namely the elderly, who are often underrepresented in studies on digital health services. Most previous studies focus on general users or urban populations, whereas this research highlights how age-related factors – such as limited digital literacy, low smartphone ownership, and dependence on assistance – directly affect the effectiveness of digital health applications like Mobile-JKN. Second, this study extends the discussion of digital health effectiveness beyond technological readiness to include social and contextual factors, such as family support, assistance from healthcare workers, and regional infrastructure limitations. This shows that the effectiveness of digital-based health services cannot be measured solely by system availability, but must also consider users' capacity and support systems. Third, the research provides context-specific insights from North Padang Lawas Regency, contributing to the limited body of literature on digital health service implementation in rural or semi-rural areas of Indonesia. These findings enrich existing national-level studies by demonstrating how local conditions influence policy outcomes and service utilization. Finally, this

study offers practical implications for policymakers and service providers, emphasizing that digital transformation in health services must be accompanied by continuous socialization, digital education, and inclusive service strategies to avoid widening health access gaps, especially among the elderly.

## THEORETICAL STUDY

### Health Service Effectiveness

In general, "Effectiveness" comes from the word "effective," which implies the achievement of success in achieving predetermined goals. Effectiveness is always related to the relationship between expected results and actual results. Effectiveness can be viewed from various perspectives and assessed in various ways, and is closely related to efficiency. Effectiveness certainly differs from efficiency. Efficiency implies the relationship between costs and results, while effectiveness is directly linked to the achievement of a goal. Effectiveness (results) is the relationship between outputs and the goals or objectives to be achieved. This definition of effectiveness is fundamentally related to the achievement of policy objectives or targets. Operational activities are considered effective if the process achieves the ultimate goals and objectives of the policy, according to (Mahsun, 2006).

According to (Agung, 2005), effectiveness is the ability to carry out tasks and functions (program activities or missions) of an organization or similar organization without stress or tension among those who implement them. Another definition of effectiveness was put forward by (Sedarmayanti, 2009), who stated that effectiveness is a measure that provides an indication of the extent to which targets can be achieved.

Contrary to the opinion of (Nasution, M. I., & Nasution, 2022), effectiveness is a measure that indicates the extent to which an organization has achieved its predetermined goals or objectives (quantity, quality, and time). Therefore, the greater the percentage of targets achieved, the higher the effectiveness. Meanwhile, according to Mahmudi (2019:86), effectiveness is related to the relationship between expected results and actual results. Effectiveness is the relationship between output and objectives. The greater the contribution of output to goal achievement, the more effective the organization, program, or activity. (Raihan, M., & Kamilah, 2021) argue that effectiveness is a broader concept that encompasses various factors both internal and external to an individual. Effectiveness indicates success or failure in achieving goals. The measure of effectiveness is a reflection of output. Effectiveness is measured by the extent to which an organization's output, policies, and procedures achieve its stated goals.

An activity is considered effective if the resulting output meets the expected goals. According to (Lestari, L., & Qarni, 2022), effectiveness is defined as the result of work completed well and successfully, in terms of time, materials, costs, etc. The concept of effectiveness can be understood using two methodologies: the first methodology, which examines a long-term perspective, and the second methodology, which focuses on a hypothetical framework.

Based on the various opinions regarding effectiveness above, it can be concluded that effectiveness is the ability of an activity, program, or organization to achieve its stated goals successfully and without stress or tension. Therefore, the effectiveness of health services is the extent to which the quality of health services provided achieves the desired results and positively impacts the health of patients or the community. According to Levey Loomba, health services are efforts undertaken by an organization, either individually or collectively, to maintain and improve health, prevent and cure disease, and restore the health of individuals, groups, and/or communities (Azwar, 1994).

In the perspective of TQM (Total Quality Management), quality is viewed broadly, where not only the results aspect is emphasized, but also includes environmental and human processes. Juliana Nasution, 2022 defines service quality as a basic guideline for service marketing, because this is a product that is marketed is a performance (of quality) and performance is also what will be

purchased by customers. Therefore, the quality of service performance is the basis for service marketing. According to Handayani, SS, Rahma, TIF, & Nasution, J. (2023), there are five elements that determine service quality, namely: "tangible (direct evidence), responsiveness (responsiveness), reliability (reliability), assurance (guarantee), and empathy (empathy)" (Irawan, 2010).

Service quality consists of several main dimensions, namely (a) tangibles, which according to (Tjiptono, 2008) is the company's ability to show its existence through the appearance of physical facilities, equipment, and communication facilities used in service; (b) responsiveness, namely the ability of service providers to provide fast, precise service, and willingness to help customers according to their needs, which includes indicators of preparedness, speed, willingness to help, and clarity of information so as to increase customer satisfaction; (c) reliability, which describes the company's ability to provide services according to promises accurately, on time, and consistently, with indicators in the form of accuracy of service, staff expertise in using equipment, reliability of information provided, and the ability to carry out service procedures correctly; (d) assurance, namely a guarantee that reflects the trustworthy attitude and honesty of staff in fostering a sense of security and customer trust, with indicators including politeness, knowledge, staff skills, effective communication, company credibility, and a sense of security felt by customers; and (e) empathy, which according to Rambat Lupiyoadi is sincere and individual attention to customers with the aim of understanding their needs and desires, which is demonstrated through the ability to communicate well, providing personal attention, and an attitude that makes customers feel appreciated and understood (Parasuraman et al., 1988).

### Mobile JKN Application

Mobile JKN is the official mobile application from BPJS Kesehatan (Indonesian Health Insurance) that allows National Health Insurance (JKN) participants to access various health services digitally anytime and anywhere. Some of the benefits of this mobile JKN application are: (a) Participants can view information about their membership status, membership number, and the location of registered health facilities. (b) Change data such as mobile phone number, email address, address, and primary health facility. (c) In addition, this application also provides other features such as health history screening, contribution information, payment of contributions and fines, and the Digital KIS (Indonesian Health Insurance Card) for accessing health services (BPJS Kesehatan, 2019).

## RESEARCH METHOD

The research method used in this study is a descriptive qualitative approach, which emphasizes data in the form of words, observations, and documents (Meha, N. L., & Nasution, 2024) (Meha, N. L., & Nasution, 2024). This approach was selected to comprehensively explore the effectiveness of healthcare services delivered through the Mobile JKN application for elderly participants in North Padang Lawas Regency, particularly at the BPJS Kesehatan Gunung Tua Office.

Data collection involved primary data, obtained directly from elderly participants as the main informants through in-depth interviews and direct observations. In addition, a literature review was conducted by examining relevant books, journals, and scientific articles to support and strengthen the analysis. Field observations at the BPJS Kesehatan Gunung Tua Office were also carried out to enhance data triangulation and ensure the validity of the findings.

The effectiveness of healthcare services through the Mobile JKN application was assessed using several operational indicators, including accessibility of services, ease of application use, elderly users' understanding of Mobile JKN features, intensity of application utilization, service efficiency, user satisfaction, and the availability of support from family members and BPJS officers. These indicators were explored through interviews, observations, and documentation to provide a

comprehensive and contextual description of Mobile JKN effectiveness among the elderly in North Padang Lawas Regency.

## RESULTS AND DISCUSSIONS

### Result

#### **Overview of the Use of the JKN Mobile Application by the Elderly at the Gunung Tua BPJS Kesehatan (Healthcare Provider Agency)**

Based on observations and interviews with elderly participants at the Gunung Tua BPJS Kesehatan Office, the utilization rate of the JKN Mobile Application is still relatively low. Most elderly participants do not fully understand the application's functions and benefits. They tend to visit the BPJS office directly for administrative tasks such as data changes, card printing, or contribution checks. Only a small proportion of elderly participants use the JKN Mobile Application, generally with the assistance of family members or BPJS officers. This situation indicates that the digital transformation of healthcare services has not fully reached the elderly due to limited digital literacy and access to technology.

#### **Factors Influencing the Effectiveness of Healthcare Services Through the JKN Mobile Application**

- a. Digital Literacy Factor, the digital literacy rate of elderly participants in the Gunung Tua area is still low. Many do not own or are not accustomed to using smartphones. Difficulty understanding how to download, install, and operate applications is a major obstacle. This low level of technology adoption makes digital services ineffective for this age group.
- b. Infrastructure and Internet Access Factors, several areas in North Padang Lawas Regency still experience limited internet connectivity. This hinders the login, registration, and data update processes in the Mobile JKN application. As a result, the application's effectiveness is reduced.
- c. Family Support Factor, family support is a crucial factor in the effectiveness of Mobile JKN use. Most seniors can utilize the application with the help of children or grandchildren who are more tech-savvy. This is possible because the Mobile JKN application can be used to access data for multiple family members on a single Family Card (KK). A single Mobile JKN account can be used to manage the membership of all family members, including seniors. Families can help seniors check their membership status, pay premiums, change health facilities (FKTP), display their digital KIS (Health Card) during treatment, and file complaints. This support increases service effectiveness because technological barriers can be overcome through the family's role as intermediary users. Furthermore, family involvement strengthens the empathy aspect of digital health services, as families play an active role in maintaining the health of seniors.

#### **Effectiveness of Healthcare Services through the JKN Mobile Application**

When viewed from Parasuraman's five service quality indicators: tangible, reliability, responsiveness, assurance, and empathy, the research results show:

- a. Tangible, the JKN Mobile Application has a modern interface and is easily accessible via smartphone. However, for seniors, the font size and numerous menus are considered less user-friendly. Nevertheless, the application effectively reduces queues at BPJS offices for users who can operate it.
- b. Reliability, the JKN Mobile Application provides accurate participant information and premium billing. However, for seniors unfamiliar with technology, system reliability is not matched by user reliability. Without assistance, digital services are difficult to utilize optimally.

- c. Responsiveness, the complaint and prompt service features in the JKN Mobile Application are effective for younger users, but do not yet reach seniors optimally. Seniors experiencing technical difficulties still require direct assistance at BPJS offices.
- d. Assurance, participant data security is guaranteed with an OTP authentication system. However, for seniors who don't understand the digital verification mechanism or don't have an active mobile phone number, this process presents a barrier. Security concerns actually add to the difficulties faced by the elderly.
- e. Empathy, is a key strength of the Gunung Tua BPJS Kesehatan service. Staff demonstrate a friendly attitude and assist seniors who have difficulty using the application. Furthermore, family support in assisting with the application operation reinforces the value of empathy in service, making the system more inclusive for seniors.

### Discussion

The effectiveness of healthcare services through the Mobile JKN application for the elderly in Gunung Tua has not yet reached an optimal level. Although Mobile JKN was designed to improve efficiency, transparency, and accessibility of BPJS Kesehatan services, its utilization among elderly participants remains limited. This finding aligns with BPJS Kesehatan's report which states that digital transformation in health services still faces challenges, particularly among vulnerable groups such as the elderly, due to disparities in digital literacy and access to technology (Tampubolon & Susilawati, 2023).

Several factors influence the effectiveness of Mobile JKN utilization among the elderly. Low digital literacy is a dominant barrier, where elderly participants experience difficulties in operating smartphones, understanding application features, and completing digital verification processes such as OTP authentication. This condition is consistent with the findings of (Wulandary, R., & Ikhsan, 2019), who reported that although Mobile JKN offers comprehensive features, its effectiveness largely depends on users' technological capabilities. Similarly, a study by (Rahmawati, D., Siregar, R., & Putri, 2021) found that elderly users tend to prefer face-to-face services due to limited confidence and familiarity with digital platforms.

Another inhibiting factor is the lack of socialization and assistance related to Mobile JKN usage. (BPJS Kesehatan, 2023) emphasizes that continuous education and outreach are essential to ensure that digital health innovations can be utilized equitably by all population groups. In Gunung Tua, limited outreach activities and inadequate digital guidance for the elderly reduce the potential effectiveness of Mobile JKN. In addition, unstable internet access in several areas of North Padang Lawas Regency further constrains the elderly from independently accessing digital services, supporting the findings of (Sari, P., & Nugroho, 2022), who highlighted infrastructure limitations as a key challenge in implementing e-health services in rural areas.

However, this study also reveals a crucial enabling factor: family support. The Mobile JKN system allows one account to manage all family members under a single Family Card (KK), enabling children or grandchildren to assist elderly family members in accessing health services. This finding is in line with (Santrock, 2002) theory of late adulthood, which emphasizes the importance of social and family support in maintaining functional independence among the elderly. Empirically, this result is supported by (Handayani, S. S., Rahma, T. I. F., & Nasution, 2023), who found that family involvement significantly improves satisfaction and effectiveness of BPJS health services, especially for participants with limited autonomy. This is further reinforced by the (World Health Organization, 2015), which highlights family and social support as key determinants in ensuring access to health services and maintaining the quality of life of older adults.

From a service effectiveness perspective, effectiveness should not be interpreted solely as the elderly's ability to independently operate the application. Conceptually, effectiveness also encompasses the extent to which a system functions socially and inclusively (Mahmudi, 2019) states that effectiveness is achieved when outputs contribute meaningfully to goal attainment, even if

intermediaries are involved. In this context, Mobile JKN can be considered functionally effective when family members act as facilitators, bridging the digital gap experienced by the elderly.

When analyzed using Parasuraman's SERVQUAL dimensions, the Mobile JKN application demonstrates mixed effectiveness. Tangible aspects such as interface design and accessibility are adequate for digitally literate users but remain less friendly for elderly users due to small font sizes and complex menus. Reliability in terms of data accuracy and service consistency is relatively high, as acknowledged by (BPJS Kesehatan, 2023). However, responsiveness and assurance are not fully optimal for the elderly, as technical difficulties still require direct assistance at BPJS offices. In contrast, the empathy dimension shows relatively strong performance, particularly through the supportive attitudes of BPJS officers and the active involvement of family members.

This study's findings are consistent with previous research by (Lestari, L., & Qarni, 2022), which emphasized that effectiveness in public service delivery is influenced not only by system performance but also by human and social factors. However, the results differ from studies conducted in urban areas, such as (Pratama, R., Hidayat, S., & Wicaksono, 2022), which found that Mobile JKN significantly improved service effectiveness due to higher digital literacy and better infrastructure. This discrepancy indicates that contextual factors, particularly demographic characteristics and regional infrastructure, play a critical role in determining the effectiveness of digital health services.

In conclusion, while Mobile JKN has not yet achieved optimal effectiveness for the elderly in Gunung Tua, it holds substantial potential. Its effectiveness becomes more apparent when supported by family involvement and proactive assistance from BPJS officers. Therefore, strengthening digital literacy programs, expanding socialization efforts, improving internet infrastructure, and institutionalizing family-based assistance models are essential to enhance the inclusive effectiveness of Mobile JKN for elderly populations.

The results and discussion are aligned with the research objectives and questions, as they comprehensively describe the level of Mobile JKN utilization among the elderly, identify key inhibiting and enabling factors, and evaluate service effectiveness using the SERVQUAL framework. The findings clearly explain why the effectiveness of Mobile JKN for elderly users in Gunung Tua has not yet reached an optimal level, while also highlighting the important role of family support and institutional assistance in enhancing inclusive digital health services.

Overall, while Mobile JKN has not yet achieved optimal effectiveness for the elderly in Gunung Tua, it holds substantial potential. Strengthening digital literacy programs, expanding socialization efforts, improving internet infrastructure, and institutionalizing family-based assistance are essential to enhance the inclusiveness and effectiveness of Mobile JKN for elderly populations.

## CONCLUSION

Based on the results of the study, the policy implications for BPJS Kesehatan in expanding the inclusiveness of digital services show that digital transformation cannot be implemented with a digital-first approach alone, but must prioritize the principle of digital-inclusive. The low utilization of the JKN Mobile Application among the elderly group emphasizes the need for a hybrid service policy that maintains face-to-face services and provides digital assistance mechanisms for elderly users. The Family Card (KK)-based access feature is a strategic policy asset that should be optimized through a family-based approach, involving children and grandchildren as official assistants in the use of digital services. In addition, increasing the inclusiveness of digital services requires strengthening sustainable digital literacy education policies through direct assistance, simple training, and socialization integrated with primary health services and community activities.

In terms of service quality, BPJS Kesehatan needs to establish standards for elderly-friendly application designs with simple displays, larger fonts, concise navigation, and faster and

more empathetic service responses. In addition, the success of digital service expansion also depends heavily on technological infrastructure support, particularly the availability of stable internet networks in rural areas, which requires cross-sector synergy with local governments and relevant stakeholders. Overall, BPJS Kesehatan's digital policies need to be directed towards fulfilling equitable access to health services by considering user limitations, regional characteristics, and family social support, so that digital transformation can truly improve the effectiveness and quality of health services evenly.

Future research is recommended to strengthen the measurement of Mobile-JKN effectiveness by applying quantitative or mixed-methods approaches, using models such as SERVQUAL, TAM, or UTAUT. Future studies should involve broader geographic coverage and more diverse respondent characteristics, and incorporate objective application usage data to improve the accuracy and generalizability of findings.

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