

Original Article

Factors associated with the utilization of the mobile national health insurance online queue system at community health center: A cross-sectional study

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Abstract

Background: The use of the National Health Insurance (M-JKN) mobile online queue system aims to improve the efficiency, safety, and quality of health services. However, it is often hindered by network errors or patients' lack of proficiency in using the system. Analysis of the utilization of the M-JKN mobile online queue system remains under-researched.

Objective: This study aims to analyze the utilization of the M-JKN online queue system at the Mekarsari Community Health Center in Banyuasin Regency.

Methods: This study uses a quantitative approach, with a cross-sectional design from the population of all patient visits from January to December, totaling 4,030 patients, and uses accidental sampling. The research sample used questionnaires for 98 (ninety-eight) respondents from March to April 2026. The analysis tests used were univariate, bivariate, and multivariate analyses with logistic regression tests.

Results: The research results showed that age with a p-value of 0.098 ($p > 0.05$), gender p-value 0.098 ($p > 0.05$), ease of use p-value 1.000 ($p > 0.05$), user attitude p-value 0.147 ($p > 0.05$), intention to use p-value 0.780 ($p > 0.05$), and user satisfaction p-value 0.659 ($p > 0.05$) were not related to the use of the M-JKN online queue. Education level had a p-value of 0.004 ($p < 0.05$) OR = 9.42 95% CI = 1.597–21.308, and perceived usefulness p-value 0.004 ($p < 0.05$) OR = 9.20 95% CI = 1.54–8.79 were related to the use of the M-JKN online queue. Multivariate analysis identified the education level aspect OR = 5.83; 95% CI = 1.597–21.308; $p = 0.008$ as the dominant factor associated with the utilization of the M-JKN Online Queue.

Conclusion: The conclusion of this study is that service quality dimensions, particularly educational level and perceived usefulness, play a significant role in increasing the utilization of the online queue system. It is recommended that the community health center focus on these two dimensions to enhance the utilization of the M-JKN online queue system.

Background

Digital transformation has become central to expanding access, improving service efficiency, and supporting progress toward Universal Health Coverage. Digital health can strengthen communication, continuity, and patient participation, but its benefits depend on whether people can access, understand, appraise, and use digital services. Digital health literacy is therefore increasingly regarded as a practical determinant of health and equitable service use (Ban et al., 2024; Chidambaram et al., 2024; Fitzpatrick, 2023; Verweel et al., 2023; Yelton et al., 2024).

Evidence consistently shows that digital health literacy is socially patterned. Educational attainment, age, income, internet experience, residence, and access to devices or connectivity influence people's capacity to engage with digital health platforms (Estrela et al., 2023; Qiu et al., 2025; Shi et al., 2024; Tran et al., 2024; Wang & Luan, 2022; Zhao et al., 2024). These inequalities may be more pronounced among older adults,

people with chronic conditions, geographically underserved communities, and socially marginalized groups (Shao et al., 2025; Shaw & Glover, 2024; Sturman et al., 2024; Zaghloul et al., 2025). Consequently, introducing a digital service without user education and assisted access may reproduce rather than reduce existing inequities.

Reliable measurement and targeted support are important for addressing these barriers. Recent studies have developed and validated instruments for assessing digital health technology literacy and have shown that tailored literacy interventions can improve older adults' ability to use digital services (Dong et al., 2023; Wang et al., 2025; Yoon et al., 2022). The rapid expansion of scholarship in this field also demonstrates growing recognition that digital competencies, rather than device ownership alone, influence effective engagement with health technologies (Yang et al., 2022).

Technology acceptance research further indicates that actual use is shaped by perceived usefulness, perceived ease of use, attitude, social influence,

facilitating conditions, and prior experience. Across systematic reviews, meta-analyses, and empirical studies, perceived usefulness has repeatedly emerged as a particularly important predictor of acceptance and continued use of mobile health services (Calegari et al., 2023; Nie et al., 2023; Perski & Short, 2021; Tao et al., 2023; Wang & Qi, 2021; Zolfaqari et al., 2024). Ease of use can support uptake, but its effect may be indirect when users do not perceive a tangible service benefit.

Acceptance also depends on whether technologies align with users' needs, routines, cultural contexts, and expectations. Studies involving older adults, Indigenous populations, patients with cancer, and users of fitness applications emphasize the importance of relevant functions, trust, technical assistance, and acceptable data-sharing practices (Changrani et al., 2024; Goodman et al., 2023; Hajesmaeel-Gohari et al., 2022; Razaghizad et al., 2023; Vietzke et al., 2023). Digital services that reduce administrative burden or facilitate access may also influence health-care utilization, including appointment attendance and hospital visits (Bo et al., 2023).

In Indonesia, BPJS Kesehatan developed the Mobile JKN application to support National Health Insurance administration and access to services. Its online queue feature allows participants to obtain a queue number before arriving at a primary health-care facility, potentially shortening registration and waiting processes. However, implementation remains dependent on patient capability, staff support, network reliability, and integration with facility workflows. At the Mekarsari Community Health Center in Banyuasin Regency, Mobile JKN online queue utilization remained far below the expected target in 2025, despite the feature's potential benefits. This local pattern is consistent with international evidence that the availability of a mobile service does not guarantee routine use.

Previous studies have predominantly examined broad mHealth acceptance, digital literacy, or overall application satisfaction. Less evidence is available on the specific factors associated with use of an online queue feature in Indonesian primary care, particularly in facilities with very low uptake. This study therefore examined the associations of age, sex, educational level, perceived usefulness, perceived ease of use, attitude toward use, behavioral intention, and user satisfaction with Mobile JKN online queue utilization.

Methods

Study Design

This study used a quantitative analytical cross-sectional design in which the independent and dependent variables were measured at the same point in time. The independent variables were age, sex, educational level, perceived usefulness, perceived ease of use, attitude toward use, behavioral intention to use, and user satisfaction. The dependent variable was utilization of the Mobile JKN online queue system at the Mekarsari Community Health Center. A cross-sectional design was considered appropriate because it enabled assessment of community utilization of Mobile JKN during the study period and identification of factors associated with users' behavior. The study was conducted at the Mekarsari Community Health Center, Selat Penuguan District, Banyuasin Regency, South Sumatra Province, from March to April 2026.

Sampling

The study population comprised all National Health Insurance participants who received outpatient services at the Mekarsari Community Health Center. Both patients who had previously used the Mobile JKN online queue and those who had not were eligible, allowing a comprehensive assessment of service utilization and factors associated with the adoption of digital health technology. Participants were recruited using convenience sampling because patients attended the community health center throughout the day without a predetermined schedule. The final sample consisted of 98 respondents. The inclusion criteria were National Health Insurance participants attending the Mekarsari Community Health Center during the study period; patients or family members who owned or used a smartphone, regardless of whether they already had a Mobile JKN account; and patients who agreed to participate and provided written informed consent. Patients requiring emergency care and those with communication limitations that prevented questionnaire completion were excluded.

Instruments

Data were collected using a previously validated questionnaire. In the original validity testing, all items had item-total correlation coefficients greater than the critical value of 0.195 and p-

values below 0.05. The questionnaire was administered in digital and printed formats. Perceptions were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Utilization of the Mobile JKN online queue was categorized as no or yes. Age was categorized as non-working age (<15 years) or working age (15-65 years); sex as male or female; and educational level as low (<junior high school) or high ($\geq$ junior high school). Perceived usefulness was categorized as less useful for scores below the mean or median and useful for scores equal to or above the mean or median. Perceived ease of use was categorized as difficult or easy using the same threshold. Attitude toward use was categorized as negative or positive, behavioral intention as no intention or intention to use, and user satisfaction as dissatisfied or satisfied.

Data Collection

Data were collected in the service area of the Mekarsari Community Health Center during the study period. Eligible respondents were approached and informed about the study objectives, procedures, voluntary nature of participation, and confidentiality before written informed consent was obtained. Data were collected using digital and printed questionnaires with identical content, item order, response options, instructions, and operational definitions to maintain measurement consistency and minimize mode-related bias. Respondents completed the questionnaire independently. Researcher assistance was limited to technical problems or clarification of instructions or terminology. Researchers did not provide sample answers, direct response choices, evaluate answers, or make comments that could influence responses. When clarification was required, standardized explanations were used for both administration modes. Findings were subsequently presented systematically in tables and narrative form and interpreted in relation to the Technology Acceptance Model and previous digital health research.

Data Analysis

Data analysis was conducted in three stages: univariate, bivariate, and multivariable analysis. Univariate analysis described the frequency distribution of each dependent and independent variable. Bivariate associations were examined

using the chi-square test at a significance level of $\alpha = 0.05$ after expected cell frequencies were assessed. Fisher's exact test was used when expected frequencies were small or a cell contained a frequency of zero, as occurred for age. Variables with $p < 0.25$ in the bivariate analysis were considered candidates for multivariable analysis. Binary logistic regression was then used to estimate the simultaneous association of the independent variables with online queue utilization. The final model was interpreted using $p < 0.05$, odds ratios (ORs), and 95% confidence intervals (CIs).

Ethical Consideration

This study was conducted in accordance with fundamental research ethics principles, including respect for autonomy, confidentiality, voluntary participation, and protection from harm. Before data collection, all eligible respondents received clear information about the study objectives, procedures, information requested, and their right to refuse or withdraw at any time without adverse consequences. Only respondents who agreed to participate and provided written informed consent were included. The inclusion and exclusion criteria also served an ethical purpose by ensuring that participants were physically and psychologically able to participate and that individuals for whom participation might be inappropriate were not burdened by the research process.

Results

Table 1 shows that 60 respondents (61.2%) did not use the Mobile JKN online queue system. Nearly all respondents were of working age (97; 99.0%), and most were female (73; 74.5%) and had a high educational level (75; 76.5%). A total of 51 respondents (52.0%) perceived the system as useful, and 86 (87.8%) perceived it as easy to use. Positive attitudes were reported by 55 respondents (56.1%), while 82 (83.7%) intended to use the system. Most respondents were satisfied with the Mobile JKN online queue system (66; 67.3%).

Bivariate analysis using the chi-square test was conducted to examine the associations between Mobile JKN online queue utilization and age, sex, educational level, perceived usefulness, perceived ease of use, attitude toward use, behavioral intention to use, and user satisfaction.

Table 1. Frequency Distribution of Respondents

Variable	Frequency (n)	Percentage (%)
Mobile JKN Online Queue Utilization		
No	60	61.2
Yes	38	38.8
Age		
Non-working age	1	1.0
Working age	97	99.0
Sex		
Male	25	25.5
Female	73	74.5
Educational level		
Low	23	23.5
High	75	76.5
Perceived usefulness		
Less useful	47	48.0
Useful	51	52.0
Perceived ease of use		
Difficult to use	12	12.2
Easy to use	86	87.8
Attitude toward use		
Negative	43	43.9
Positive	55	56.1
Intention to use		
No intention	16	16.3
Intention to use	82	83.7
User satisfaction		
Dissatisfied	32	32.7
Satisfied	66	67.3

Table 2. Associations Between Independent Variables and Mobile JKN Online Queue Utilization

Variables	Online Queue Utilization				Total	%	p-value	OR	95% CI
	No n	%	Yes n	%					
Age									
Non-working age	0	0.0	1	1.0	1	100	0.388	0.21	0.008–5.21
Working age	60	61.2	37	37.8	97	100			
Sex									
Male	19	19.4	6	6.1	25	100	0.098	2.47	0.89 - 6.90
Female	41	41.8	32	32.7	73	100			
Educational level									
Low	20	20.4	3	3.1	23	100	0.004	9.42	1.60 -21.34
High	40	40.8	35	35.7	75	100			
Perceived usefulness									
Less useful	36	36.9	11	11.2	47	100	0.004	9.20	1.54 -8.79
Useful	24	24.5	27	27.6	51	100			
Perceived ease of use									
Difficult to use	7	7.1	5	5.1	12	100	1.000	0.87	0.27–2.81
Easy to use	53	54.1	33	33.7	86	100			
Attitude toward use									
Negative	30	30.6	13	13.3	43	100	0.147	1.92	0.83–4.46
Positive	30	30.6	25	25.5	55	100			
Intention to use									
No intention	9	9.2	7	7.1	16	100	0.780	0.78	0.26–2.31
Intention to use	51	52.0	31	31.6	82	100			
User satisfaction									
Dissatisfied	21	21.4	11	11.2	32	100	0.659	1.32	0.55 - 3.18
Satisfied	39	39.8	27	27.6	66	100			

As shown in Table 2, age ($p = 0.388$), sex ($p = 0.098$), perceived ease of use ($p = 1.000$), attitude toward use ($p = 0.147$), behavioral intention to use ($p = 0.780$), and user satisfaction ($p = 0.659$) were not significantly associated with online queue utilization. Educational level was significantly associated with utilization ($p = 0.004$; OR = 9.42), as was perceived usefulness ($p = 0.004$; OR = 9.20).

Variables with $p < 0.25$ in the bivariate analysis were retained as candidates for multivariable analysis.

Table 3. Initial Multivariable Logistic Regression Model

Variable	<i>p-value</i>	OR
Sex	0.198	2.067
Educational level	0.012	5.621
Perceived usefulness	0.021	3.395
Attitude toward use	0.994	1.004

Table 5. Final Multivariable Logistic Regression Model

		<i>p-value</i>	OR	CI 95% Exp(B)	
				<i>Lower</i>	<i>Upper</i>
Step 1*	Educational level	0.008	5.83	1.597	21.308
	Constant	0.004			

In the final multivariable model, educational level was significantly associated with Mobile JKN online queue utilization at the Mekarsari Community Health Center in 2026 (OR = 5.83; 95% CI = 1.597-21.308; $p = 0.008$). Although the OR was relatively large, the wide confidence interval warrants caution. Educational level should therefore be interpreted as a statistically significant associated factor rather than definitively as the most dominant factor.

Discussion

This study found that educational level and perceived usefulness were significantly associated with Mobile JKN online queue utilization, whereas age, sex, perceived ease of use, attitude toward use, behavioral intention, and user satisfaction were not. The result suggests that actual use of a digital queue may depend more on users' capacity to understand the service and their perception of its practical value than on favorable attitudes or stated intentions alone. This interpretation is consistent with contemporary acceptance research showing that perceived usefulness is a robust determinant of mHealth use and

Table 3 presents the initial logistic regression model, which included sex, educational level, perceived usefulness, and attitude toward use. Educational level ($p = 0.012$; OR = 5.621) and perceived usefulness ($p = 0.021$; OR = 3.395) remained statistically significant.

Table 4. Reduced Multivariable Model

Independent variable	<i>p-value</i>	OR
Educational level	0.012	5.62
Perceived usefulness	0.021	3.39

As shown in Table 4, educational level had the strongest association with Mobile JKN online queue utilization (OR = 5.62), followed by perceived usefulness (OR = 3.39). Variables with the largest nonsignificant p -values were removed sequentially during model development.

continued-use intention (Calegari et al., 2023; Nie et al., 2023; Tao et al., 2023; Wang & Qi, 2021).

Respondents with a higher educational level had greater odds of using the online queue. Education may facilitate comprehension of registration instructions, account management, verification procedures, and problem-solving when technical obstacles arise. This finding is supported by a systematic review and meta-analysis identifying education as an important sociodemographic determinant of digital health literacy (Estrela et al., 2023). Studies in community and older populations similarly link educational attainment and internet experience with stronger digital health literacy (Qiu et al., 2025; Shi et al., 2024; Tran et al., 2024; Wang & Luan, 2022; Zhao et al., 2024). The wide confidence interval in the present study nevertheless indicates limited precision, so educational level should be interpreted as a significant associated factor rather than definitive proof of causal dominance.

Perceived usefulness was also significantly associated with utilization. Users may be more willing to adopt Mobile JKN when they recognize

immediate benefits, such as shorter registration processes, reduced waiting, and greater certainty about service order. This finding accords with studies showing that usefulness, compatibility with daily routines, relevant functions, and perceived value support the acceptance of mobile health technology (Goodman et al., 2023; Perski & Short, 2021; Vietzke et al., 2023; Zolfaqari et al., 2024). Evidence that mobile health adoption can influence subsequent health-service use further underscores the importance of making benefits visible and measurable to patients (Bo et al., 2023).

Perceived ease of use was not significantly associated with utilization. This result does not necessarily mean that usability is unimportant. Ease of use may influence behavior indirectly through perceived usefulness, prior experience, or facilitating support, and a generally high proportion of respondents who considered the application easy to use may have reduced variability. Reviews of mHealth evaluation instruments and implementation studies indicate that usability, satisfaction, and acceptance are related but distinct constructs and should not be treated as interchangeable outcomes (Hajesmaeel-Gohari et al., 2022; Razaghizad et al., 2023). The absence of significant associations for age and sex may likewise reflect the highly uneven distribution of this sample rather than the absence of digital inequality.

The findings should also be interpreted within the broader digital health equity context. Access to a smartphone does not ensure the skills, connectivity, confidence, trust, or assistance needed to complete a digital task (Ban et al., 2024; Chidambaram et al., 2024; Shaw & Glover, 2024). Digital exclusion can be intensified among people with fewer socioeconomic resources or chronic health needs (Shao et al., 2025; Sturman et al., 2024; Zaghloul et al., 2025). Assessment tools and literacy interventions may help facilities identify patients requiring assisted registration, hands-on demonstrations, or alternative access routes (Dong et al., 2023; Wang et al., 2025; Yoon et al., 2022).

These results have practical implications for the Mekarsari Community Health Center and BPJS Kesehatan. Education should use short, visual, step-by-step materials and supervised practice during patient visits. Staff should explicitly

demonstrate how the online queue saves time and clarify what patients should do when verification or network problems occur. Support should be culturally appropriate and responsive to varying literacy levels, as emphasized in research involving Indigenous and other underserved populations (Goodman et al., 2023; Sturman et al., 2024). Periodic monitoring should distinguish account ownership, intention, first use, successful completion, and repeated use because each represents a different stage of adoption (Perski & Short, 2021; Yang et al., 2022).

This study has several limitations. Its cross-sectional design precludes causal or temporal inference, and self-reported measures may be affected by recall and response bias. The study was conducted at one community health center, limiting generalizability. The sample included very few respondents outside working age, which reduced the ability to estimate age-related differences. Potential determinants such as digital health literacy, household income, connectivity, smartphone proficiency, staff assistance, trust, privacy concerns, and prior application experience were not measured, although recent literature identifies them as relevant to digital uptake (Fitzpatrick, 2023; Verweel et al., 2023; Yelton et al., 2024). Future multicenter and longitudinal studies should incorporate these variables and use validated literacy measures.

Conclusion and Recommendation

Educational level and perceived usefulness were significantly associated with utilization of the Mobile JKN online queue system at the Mekarsari Community Health Center in 2026. Educational level showed the strongest association in the final model. Age, sex, perceived ease of use, attitude toward use, behavioral intention to use, and user satisfaction were not directly associated with utilization. These findings indicate that even among working-age respondents who considered the application easy to use and intended to use it, actual utilization may still depend on additional enabling factors. Targeted education, practical assistance, and clear communication of the system's benefits are therefore recommended to increase uptake.

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Declaration of conflict of interest

The authors declare no competing interests.

Declaration on the Use of AI

No AI tools were used in the preparation of this manuscript.

Data Availability Statement

Data sharing is not applicable to this article.

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