



Compliance with National Health Insurance Contribution Payments among Non-Wage Workers

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Abstract

National Health Insurance (JKN) contribution compliance among Non-Wage Workers (PBPU) is crucial for maintaining sustainable access to healthcare services; however, 16,182 (58.14%) PBPU members in Tanggamus Regency remain inactive. This study aimed to identify factors associated with JKN contribution compliance among PBPU members. A quantitative cross-sectional study was conducted among 124 Non-Wage Workers selected using simple random sampling. Data were collected using structured questionnaires and analyzed using univariate, bivariate, and multivariate analyses to assess compliance, self-efficacy, and Health Belief Model constructs. The results showed that 60.5% of respondents were non-compliant with JKN contribution payments. Most respondents reported low perceived vulnerability (57.3%), perceived seriousness (58.1%), and cues to action (53.2%), but high perceived benefits (57.3%), perceived barriers (61.3%), and self-efficacy (54.8%). Significant associations were found between JKN contribution compliance and perceived vulnerability, perceived benefits, perceived seriousness, perceived barriers, cues to action, and self-efficacy (all $p < 0.05$). In the multivariate analysis, perceived vulnerability emerged as the dominant factor associated with compliance ($p < 0.001$; adjusted OR = 13.481; 95% CI: 5.017–36.219), although the wide confidence interval indicates that the magnitude of the association should be interpreted with caution. These findings suggest that interventions to improve PBPU contribution compliance should prioritize risk-based health education emphasizing the potential financial consequences of high healthcare costs without JKN coverage. Such interventions could be integrated through JKN cadres, the Mobile JKN platform, and targeted social media campaigns to strengthen participants' perceptions of health vulnerability and encourage sustained contribution compliance.

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1. INTRODUCTION

Compliance with National Health Insurance (JKN) contribution payments among Non-Wage Workers (PBPJ/independent participants) is a critical determinant of achieving Universal Health Coverage (UHC) and maintaining the sustainability of the health system (Cheng et al., 2025). In Indonesia, BPJS Kesehatan mandates that premium payments be made by the 10th of each month; however, the PBPJ segment remains the largest contributor to contribution arrears and participant inactivity nationally (Badan Penyelenggara Jaminan Sosial, 2025a). By 2024, approximately 48.5% of PBPJ members nationwide were classified as inactive. This phenomenon was particularly evident in Lampung Province and, specifically, Tanggamus Regency, where inactive PBPJ participants accounted for 58.14%, with total outstanding contributions exceeding Rp12.3 billion (Badan Penyelenggara Jaminan Sosial, 2024). Low compliance has consequences at multiple levels: it may limit participants' access to healthcare services and expose them to potentially catastrophic out-of-pocket expenditures, while simultaneously placing pressure on BPJS Kesehatan's financial sustainability, contributing to financial deficits, and potentially affecting the quality of public healthcare delivery because of delayed claims to healthcare facilities (Djamhari et al., 2020; Dewan Jaminan Sosial Nasional, 2024).

Conceptually, regular premium payment constitutes a proactive health-protective behaviour aimed at mitigating catastrophic out-of-pocket spending through a structured risk-sharing scheme (Sarwono, 2017). This behavioural mechanism is deeply rooted in the Health Belief Model (HBM), which posits that health-related actions are guided by individuals' cognitive assessments of perceived susceptibility to illness, perceived severity of its consequences, perceived benefits of the recommended action, and perceived barriers to undertaking the behaviour (Nugraha, 2024; Glanz et al., 2015). Previous empirical studies have utilized this framework to investigate compliance. For instance, research in East Teluk Jambé highlighted that cues to action served as the dominant motivator for timely payments (Bulan, 2025), whereas studies in Mesuji Regency and Depok City emphasized that compliance was strongly associated with perceived vulnerability, awareness of benefits, and high self-efficacy in overcoming technical or financial barriers (Utami et al., 2024; Hafizhawita, 2023).

Despite these insights, current evidence has largely focused on urban or structurally stable settings, leaving a critical knowledge gap regarding how these psychosocial configurations operate in rural and peripheral areas such as Tanggamus Regency (Rachmayani, 2024). In these regions, geographic constraints, fluctuating informal incomes, and distinctive administrative dynamics may shape behavioural cues differently from those observed in urbanized centres. Furthermore, existing literature presents divergent findings regarding whether administrative cues to action or internal risk perceptions (perceived susceptibility) serve as the primary catalysts for sustaining active membership. This knowledge gap may limit local policymakers' ability to design targeted behavioural interventions that extend beyond addressing financial capacity alone (Dinas Kesehatan Provinsi Lampung, 2024).

The novelty of this study lies in its simultaneous examination of all six Health Belief Model constructs perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy within a single rural-peripheral setting. Previous HBM-based studies in Indonesia have generally examined only a subset of these constructs or have focused on urban and structurally stable populations. By situating the analysis in Tanggamus Regency, a geographically peripheral district characterized by fluctuating informal incomes, this study extends the HBM literature by clarifying which

psychosocial determinants are most salient for sustaining JKN contribution compliance outside the urban contexts that have dominated previous research.

The BPJS Kesehatan Bandar Lampung Branch report on the compliance of PBPU participants with premium payments in Tanggamus Regency in November 2025 showed that 15,338 participants, or 45.52%, were categorized as non-compliant with regular JKN premium payments. In terms of membership status, PBPU participants had a higher inactivity rate than other membership segments, such as Wage Earners or Premium Assistance Recipients (Badan Penyelenggara Jaminan Sosial, 2025b). Therefore, this study aims to identify factors associated with JKN contribution compliance among PBPU members.

2. METHODS

The research design was a quantitative analytic study with a cross-sectional approach, which was used to examine the relationship between risk factors and outcomes through observations conducted at a single point in time. This study simultaneously measured the independent variables, consisting of perceived vulnerability, perceived seriousness, perceived benefits, perceived barriers, cues to action, and self-efficacy, and the dependent variable, namely JKN contribution compliance among Non-Wage Workers (PBPU). Tanggamus Regency was selected as the research location because of the significant challenges related to inactive PBPU participants and high outstanding contribution receivables within the service area of the BPJS Kesehatan Bandar Lampung Branch. The study was conducted in January 2026.

Data were collected using a structured questionnaire that had been evaluated for its psychometric properties. Validity was assessed using the Pearson Product–Moment correlation technique, followed by an assessment of internal consistency using Cronbach’s alpha coefficient for the valid items. After obtaining institutional permission from Universitas Mitra Indonesia and BPJS Kesehatan KC Bandar Lampung, population data were screened based on predetermined inclusion and exclusion criteria, with the head of the family serving as the individual unit of analysis. Eligible participants were catalogued sequentially and randomly selected using a computer-generated random number generator. To locate the addresses of selected respondents, the researchers collaborated with local Community Health Centers and used the PIS-PK application. Field data collection was assisted by trained enumerators.

Data processing and analysis were conducted in several stages using statistical software. Univariate analysis was performed to describe the frequency distributions and percentages of each study variable, including contribution compliance, perceived vulnerability, perceived seriousness, perceived benefits, perceived barriers, cues to action, and self-efficacy. Bivariate analysis using the chi-square test was conducted to evaluate the relationships between the independent variables and PBPU contribution compliance, with statistical significance assessed at an alpha level of 0.05. The strength of the associations and risk configurations was determined using odds ratios (ORs), consistent with the cross-sectional study design. Furthermore, multivariate analysis using logistic regression was performed to assess the simultaneous associations of all independent variables with the categorical dependent variable (compliant vs. non-compliant) while controlling for potential confounding factors. The dominant predictor was identified based on the highest adjusted odds ratio (AOR) in the final model.

The minimum sample size was calculated using the Lemeshow formula for a single-proportion cross-sectional design, based on the 58.14% inactive-membership proportion reported for Tanggamus Regency, a 95% confidence level ($Z = 1.96$), and a 10% margin of error, yielding a minimum requirement of 92 respondents. The final sample of 124

respondents therefore exceeded the minimum sample size requirement. Inclusion criteria comprised PBPU heads of household aged 18–64 years who had been registered as JKN participants for at least one year and were willing to provide informed consent. Respondents who were bedridden, cognitively impaired, or temporarily absent from the research area during data collection were excluded.

The questionnaire instrument was developed from validated HBM-based instruments used in previous Indonesian studies and was further evaluated for content validity through expert judgment before field implementation. The Pearson Product–Moment validity test yielded item total correlation coefficients above the critical r-table value ($r > 0.176$ for $n = 124$). The subsequent reliability assessment produced Cronbach’s alpha coefficients above 0.70 for all constructs, indicating that the instrument demonstrated acceptable validity and reliability. This study obtained ethical approval from the Health Research Ethics Committee of Universitas Mitra Indonesia before data collection. All respondents provided written informed consent after receiving an explanation of the study’s purpose, procedures, and confidentiality protections.

3. RESULTS AND DISCUSSION

These data describe the characteristics of the study respondents, including their compliance behaviour in paying JKN premiums, perceived vulnerability, perceived benefits, perceived seriousness, perceived barriers, cues to action, and self-efficacy. The data are presented in tabular form and interpreted as follows:

Table 1. Frequency distribution of compliance in paying JKN contributions and health belief model variables among PBPU participants.

Variable	Category	n	%
Paying Compliance	Compliant	49	39.5
	Not Compliant	75	60.5
Perceived Vulnerability	Low	71	57.3
	High	53	42.7
Perceived Benefits	Low	53	42.7
	High	71	57.3
Perceived Seriousness	Low	72	58.1
	High	52	41.9
Perceived Barriers	Low	48	38.7
	High	76	61.3
Cues to Action	Low	66	53.2
	High	58	46.8
Self-Efficacy	Low	56	45.2
	High	68	54.8
Total	n = 124	124	100

Based on Table 1, of the 124 Non-Wage Recipient Workers (PBPU) participants, the majority were non-compliant with paying JKN contributions, accounting for 75 respondents (60.5%), while 49 respondents (39.5%) were compliant. This finding indicates that the level of non-compliance in JKN contribution payments remains relatively high among PBPU participants.

Regarding perceived vulnerability, most respondents had a low level of perceived vulnerability, with 71 respondents (57.3%), while 53 respondents (42.7%) had a high level. This finding suggests that most participants may not have a strong perception of their

susceptibility to or risk of experiencing health problems. For perceived benefits, the majority of respondents had a high perception of benefits, accounting for 71 respondents (57.3%), whereas 53 respondents (42.7%) had a low perception of benefits. This indicates that most participants recognised the benefits of JKN membership and contribution payments, although this understanding was not necessarily reflected in their compliance with regular contribution payments. Furthermore, most respondents had a low level of perceived seriousness, with 72 respondents (58.1%), while 52 respondents (41.9%) had a high level. This finding suggests that most participants did not fully perceive the potential consequences of health problems or the risks associated with inadequate health protection as serious.

Regarding perceived barriers, the majority of respondents reported high barriers, accounting for 76 respondents (61.3%), while 48 respondents (38.7%) reported low barriers. This finding indicates that participants experienced various obstacles that may hinder them from paying JKN contributions regularly. For cues to action, most respondents were in the low category, with 66 respondents (53.2%), while 58 respondents (46.8%) were in the high category. This suggests that the triggers, encouragement, or external stimuli that could motivate participants to make regular contribution payments were still relatively limited. Regarding self-efficacy, the majority of respondents had high self-efficacy, accounting for 68 respondents (54.8%), whereas 56 respondents (45.2%) had low self-efficacy. This finding indicates that most participants had a relatively strong level of confidence in their ability to pay JKN contributions.

The distribution of the data reveals an interesting pattern. Although most participants reported high perceived benefits and self-efficacy, the majority were still non-compliant with paying JKN contributions. This finding suggests that compliance behaviour may be influenced not only by an understanding of benefits and individuals' confidence in their ability to pay but also by high perceived barriers, low perceived vulnerability and seriousness, and limited cues to action. Therefore, further analysis is required to determine the relationships and effects of each Health Belief Model construct on compliance with JKN contribution payments among PBPU participants.

Table 2. Bivariate analysis of health belief model constructs and cues to action with compliance in paying JKN contributions.

Variable	Category	Compliant		Non-compliant		Total	%	p-value	OR (95% CI)
		n	%	n	%				
Perceived Vulnerability	High	40	32.3	13	10.5	53	100	0.000	21.197 (8.249–54.168)
	Low	9	7.0	62	50.0	71	100		
Perceived Benefits	High	39	31.5	32	25.8	71	100	0.000	5.241 (2.281–12.041)
	Low	10	8.1	43	34.7	53	100		
Perceived Seriousness	High	28	22.6	24	19.4	52	100	0.010	2.833 (1.345–5.970)
	Low	21	16.9	51	41.1	72	100		

Perceived Barriers	High	18	14.5	58	46.8	76	100	0.000	0.170 (0.070–0.376)
	Low	31	25.0	17	13.7	48	100		
Cues to Action	High	33	26.6	25	20.2	58	100	0.000	4.125 (1.917–8.875)
	Low	16	12.9	50	40.3	66	100		
Total	n = 124	49	39.5	75	60.5	124	100		

Table 2 presents the bivariate analysis of Health Belief Model (HBM) constructs and cues to action in relation to compliance with paying JKN contributions among PBPU participants. The analysis shows that all examined variables were significantly associated with compliance in paying JKN contributions ($p < 0.05$).

Regarding perceived vulnerability, participants with high perceived vulnerability demonstrated a substantially higher level of compliance. Among participants with high perceived vulnerability, 40 participants (32.3%) were compliant, whereas 13 participants (10.5%) were non-compliant. In contrast, among those with low perceived vulnerability, only 9 participants (7.0%) were compliant, while 62 participants (50.0%) were non-compliant. The association was statistically significant ($p < 0.001$), with an OR of 21.197 (95% CI: 8.249–54.168). This indicates that participants with high perceived vulnerability had approximately 21 times higher odds of being compliant with JKN contribution payments than those with low perceived vulnerability.

For perceived benefits, participants with high perceived benefits were more likely to comply with JKN contribution payments than those with low perceived benefits. Among participants with high perceived benefits, 39 (31.5%) were compliant and 32 (25.8%) were non-compliant. Conversely, among those with low perceived benefits, 10 participants (8.1%) were compliant, while 43 participants (34.7%) were non-compliant. This relationship was statistically significant ($p < 0.001$), with an OR of 5.241 (95% CI: 2.281–12.041). Thus, participants with high perceived benefits had approximately 5.2 times higher odds of complying with JKN contribution payments.

Similarly, perceived seriousness was significantly associated with compliance. Among participants with high perceived seriousness, 28 participants (22.6%) were compliant, compared with 24 participants (19.4%) who were non-compliant. Among participants with low perceived seriousness, 21 participants (16.9%) were compliant, while 51 participants (41.1%) were non-compliant. The association was statistically significant ($p = 0.010$), with an OR of 2.833 (95% CI: 1.345–5.970). This finding indicates that participants with high perceived seriousness had approximately 2.8 times higher odds of complying with JKN contribution payments than those with low perceived seriousness.

Regarding perceived barriers, an inverse association was observed. Among participants with high perceived barriers, only 18 participants (14.5%) were compliant, while 58 participants (46.8%) were non-compliant. In contrast, among those with low perceived barriers, 31 participants (25.0%) were compliant and 17 participants (13.7%) were non-compliant. This association was statistically significant ($p < 0.001$), with an OR of 0.170 (95% CI: 0.070–0.376). An OR below 1 indicates that high perceived barriers were associated with lower odds of compliance. Specifically, participants with high perceived barriers had approximately 83.0% lower odds of complying with JKN contribution payments compared with those with low perceived barriers.

Finally, cues to action were significantly associated with compliance in paying JKN contributions. Among participants with high cues to action, 33 participants (26.6%) were

compliant, whereas 25 participants (20.2%) were non-compliant. Conversely, among those with low cues to action, only 16 participants (12.9%) were compliant, while 50 participants (40.3%) were non-compliant. The relationship was statistically significant ($p < 0.001$), with an OR of 4.125 (95% CI: 1.917–8.875). This indicates that participants with high cues to action had approximately 4.1 times higher odds of complying with JKN contribution payments compared with those with low cues to action.

The findings demonstrate that all examined HBM constructs and cues to action were significantly associated with compliance in paying JKN contributions. Perceived vulnerability showed the strongest positive association with compliance, followed by perceived benefits, cues to action, and perceived seriousness. In contrast, perceived barriers demonstrated a negative association with compliance, indicating that greater perceived obstacles may substantially reduce participants' likelihood of paying JKN contributions regularly. These findings suggest that efforts to improve compliance should focus on strengthening participants' awareness of their vulnerability and the seriousness of health risks, increasing their understanding of the benefits of JKN participation, providing effective cues or reminders to encourage payment, and reducing practical and perceived barriers to regular contribution payments.

Table 3. The relationship between self-efficacy and compliance in paying JKN contributions.

Variable	Compliance in Paying JKN Contributions				Amount		P-value	OR (95% CI)
	Obey		Not Compliant					
	n	%	n	%	n	%		
Self-Efficacy								
High	36	29.0	32	24.8	68	100	0.001	3.721 (1.702-8.134)
Low	13	10.5	43	34.7	56	100		
Total	49	39.5	75	60.5	124	100		

Table 3 shows that, among the 68 respondents with high self-efficacy, 36 respondents (29.0%) were compliant with JKN contribution payments, while 32 respondents (24.8%) were non-compliant. Among the 56 respondents with low self-efficacy, 13 respondents (10.5%) were compliant with JKN contribution payments, while 43 respondents (34.7%) were non-compliant. The results of the chi-square test showed that the self-efficacy variable was significantly associated with compliance with JKN contribution payments, with a p-value of 0.001 (<0.05). Therefore, the null hypothesis was rejected, indicating a significant relationship between self-efficacy and compliance with JKN contribution payments.

Table 4. Results of multivariate analysis of modelling between perceived vulnerability, perceived barriers, and cues to action with compliance in paying JKN contributions in Tanggamus Regency.

Variable	B	Forest	P Wald	OR 95% CI
Perception of Vulnerability	2.601	26.611	0.000	(13.481) 5.017-36.219
Perception of Barriers	-1.238	5.800	0.016	(0.290) 0.106-0.794
Cueis to Action	1.044	4.307	0.038	(2.842) 1.060-7.620

Constant	-1.482	7.719	0.005
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-2 Log Likelihood=102,813
p-value = 0,000
Nagelkerke R Square = 0.543
G = 63,596

Table 4 presents the results of the multivariate logistic regression analysis, which demonstrated that perceived vulnerability, perceived barriers, and cues to action were simultaneously and significantly associated with JKN contribution compliance among PBPU participants. The Nagelkerke R² value of 0.543 indicates that these three variables collectively explained 54.3% of the variation in compliance behaviour.

Perceived vulnerability emerged as the most dominant predictor of JKN contribution compliance. Participants with high perceived vulnerability had 13.481 times higher odds of complying with JKN contribution payments than those with low perceived vulnerability. Cues to action also demonstrated a positive association with compliance, indicating that participants with stronger internal or external triggers to take action were more likely to comply with their contribution payment obligations. In contrast, perceived barriers showed a significant inverse association with compliance, confirming that greater perceived obstacles were associated with a lower likelihood of complying with JKN contribution payments.

The findings should be interpreted with caution because this study employed a cross-sectional design. Although statistically significant associations were observed between Health Belief Model constructs and JKN contribution compliance, these relationships do not establish causality. Exposure variables and compliance behaviour were measured simultaneously at a single point in time; therefore, the temporal sequence between psychosocial perceptions and compliance behaviour could not be determined. Consequently, reverse causation cannot be ruled out. For example, individuals who were non-compliant with JKN contribution payments may subsequently develop lower perceptions of vulnerability or different health-related beliefs. Therefore, the findings should be interpreted as identifying factors associated with JKN contribution compliance rather than as confirming causal determinants of compliance behaviour

DISCUSSION

Regarding perceived vulnerability, the findings demonstrate a significant association between perceived vulnerability and compliance with JKN contribution payments. This finding is supported by empirical evidence from previous studies. Research conducted in Mesuji Regency demonstrated that JKN participants with high perceived vulnerability or risk perception were 5.637 times more likely to maintain compliance with premium payments than those with low risk awareness (Utami et al., 2024). This finding is consistent with research conducted in East Teluk Jambe, which indicated that independent participants who perceived themselves as vulnerable to health risks were up to six times more likely to pay their contributions regularly (Bulan, 2025). Furthermore, longitudinal studies have emphasized that a well-developed perception of disease susceptibility is an important factor in sustaining long-term preventive health behaviours within informal communities.

From a theoretical perspective, within the Health Belief Model (HBM), perceived vulnerability, or perceived susceptibility, represents an individual's subjective assessment of the likelihood of experiencing a health threat. This perception can influence whether JKN contributions are viewed merely as an administrative obligation or as an important mechanism for managing potential health-related risks (Ramlawati, 2020). When individuals recognize that illness may result in substantial medical and financial

consequences, their perceived susceptibility may motivate them to maintain health insurance coverage. In the present study, the relatively strong association between perceived vulnerability and compliance suggests that participants who perceived themselves as more susceptible to health problems were more likely to fulfil their contribution obligations. Therefore, interventions should strengthen realistic perceptions of health risks, particularly among individuals who may underestimate their vulnerability because they currently perceive themselves as healthy. JKN cadres at the village level could play an important role as risk communicators by educating rural families about the unpredictable nature of health emergencies and emphasizing that monthly contributions represent an important form of family financial protection rather than a discretionary expenditure.

Regarding perceived benefits, the findings indicate that recognizing the benefits of JKN membership is significantly associated with contribution compliance. The critical role of perceived benefits in encouraging health-related behaviour has been widely documented across different healthcare contexts. Research conducted at Lubuk Basung Community Health Center demonstrated that positive community perceptions regarding the usefulness of healthcare services were associated with greater willingness among independent participants to fulfil their monthly contribution obligations. Similarly, a study conducted in Depok City confirmed that an individual's understanding of the usefulness of healthcare services was directly associated with compliance among independent JKN participants (Adani et al., 2019). Moreover, empirical evidence from independent participants in the Greater Jakarta area indicated that higher satisfaction with primary and secondary healthcare infrastructure enhanced the perceived tangible benefits of the JKN program and increased the probability of contribution compliance by up to 9.5% (Nurhasana et al., 2022).

Within the HBM framework, perceived benefits refer to an individual's assessment of the advantages of undertaking a recommended health-related action. Individuals are more likely to engage in such behaviour when the perceived benefits outweigh the anticipated costs or disadvantages (Notoatmodjo, 2016). In the context of JKN participation, positive experiences with healthcare services may strengthen institutional trust and reinforce perceptions that contribution payments constitute a worthwhile long-term investment in health protection. Conversely, unsatisfactory service experiences may weaken perceived benefits and reduce motivation to maintain regular payments. Therefore, BPJS Kesehatan and local stakeholders should strengthen communication regarding the practical and financial benefits of JKN membership through targeted outreach activities. JKN cadres should be equipped to clearly communicate the value of continued health coverage, including the financial protection provided when participants require costly healthcare services.

With respect to perceived seriousness, the findings indicate a significant association between perceived seriousness and compliance with JKN contribution payments. This relationship is supported by regional empirical evidence. Previous research in Mesuji Regency reported that participants with a high perception of disease seriousness were 5.637 times more likely to remain compliant than those who perceived health threats as less serious (Utami et al., 2024). This finding is consistent with research conducted in East Teluk Jame, which concluded that awareness of disease severity significantly contributed to participants' efforts to maintain active membership status (Bulan, 2025). Additionally, studies in Tlogosari Kulon demonstrated that a clear understanding of the severe medical and financial consequences of chronic conditions, such as kidney and heart failure, may encourage informal workers to avoid potentially catastrophic out-of-pocket healthcare expenditures.

Theoretically, perceived seriousness in the HBM refers to an individual's assessment of the potential severity of a health threat and its consequences, including both medical and socioeconomic impacts (Cheng et al., 2025). When individuals recognize that illness without adequate health insurance may result in substantial financial instability or even household impoverishment, the motivation to maintain active insurance coverage may increase. Conversely, underestimating these consequences may cause JKN contributions to be perceived as a low-priority expenditure. Accordingly, health education should emphasize realistic consequences of being uninsured, particularly the potential financial burden associated with major medical procedures and prolonged treatment. JKN cadres could serve as community-based health risk communicators by providing understandable information regarding the medical and financial implications of serious illnesses and the protective role of JKN membership.

Regarding perceived barriers, the findings indicate a significant inverse association between perceived barriers and compliance with JKN contribution payments. This finding is consistent with literature suggesting that financial, administrative, and structural barriers can substantially hinder the sustainability of health insurance contributions. Longitudinal research in the Greater Jakarta area identified income uncertainty, perceived high premium costs, and unexpected premium increases as important barriers contributing to premium arrears among independent participants. Furthermore, research by Zulkhaidah et al. (2025) confirmed that administrative difficulties and the substantial financial burden associated with supporting multiple family dependents were directly associated with recurrent delays in contribution payments. Empirical evidence from East Teluk Jambe also indicated that physical, economic, and bureaucratic barriers exerted a negative influence on participants' motivation to maintain active membership.

Within the HBM, perceived barriers represent an individual's assessment of the physical, financial, administrative, or psychological obstacles that may impede the adoption of a recommended behaviour. Even when individuals recognize health risks and understand the benefits of health insurance, substantial perceived barriers may discourage them from maintaining regular payments. In the present study, the inverse association between perceived barriers and compliance reinforces the importance of addressing these obstacles as part of strategies to improve JKN contribution compliance. Efforts should therefore focus on reducing practical and financial barriers to payment. The government and BPJS Kesehatan should strengthen mechanisms that facilitate flexible contribution payment and provide appropriate support for economically vulnerable households, including structured payment arrangements where applicable (Pemerintah Pusat Indonesia, 2024). In addition, stronger coordination between BPJS Kesehatan and social protection programs could help identify structurally vulnerable informal workers who may be eligible for government-funded membership categories. Financial literacy initiatives delivered by JKN cadres could further assist households in prioritizing health protection within their household budgets.

Regarding cues to action, the findings demonstrate a significant association between cues to action and compliance with JKN contribution payments. Empirical studies consistently identify cues to action as important triggers that translate health-related intentions into actual behaviour. Research at Lubuk Basung Community Health Center demonstrated that family support and direct information from healthcare workers were important triggers for maintaining compliance among independent participants (Handayani et al., 2022). Furthermore, evidence concerning automated communication channels suggests that systematic use of SMS messages and personalized Mobile JKN application notifications may improve compliance by reducing forgetfulness and providing timely reminders. Studies in Mesuji Regency also indicated that regular exposure to

positive information concerning JKN benefits through social media could function as an external stimulus encouraging timely contribution payments.

Within the HBM, cues to action function as activating stimuli that encourage individuals to translate existing health beliefs into specific behaviours. Even when individuals have high perceived vulnerability and recognize the benefits of JKN membership, the actual act of making a payment may not occur without a clear internal or external trigger. Cues to action can therefore help bridge the gap between intention and behaviour. Based on this perspective, BPJS Kesehatan could strengthen its reminder systems through timely, accessible, and multi-channel payment notifications tailored to the circumstances of informal workers. JKN cadres could also be strengthened as community-based human cues through structured educational visits and the strategic placement of payment reminders in village public facilities.

Finally, regarding self-efficacy, the findings should be interpreted in the context of the HBM framework. Although self-efficacy was associated with compliance at the bivariate level, it did not remain a significant predictor in the multivariate model after other HBM constructs were considered. Sociomedical literature identifies self-efficacy as an important psychological factor governing long-term behavioural regulation under changing socioeconomic conditions. Research in South Tangerang demonstrated that higher self-efficacy empowered independent participants to manage their financial priorities more effectively, making them more disciplined in maintaining premium payments than individuals who felt less capable of managing their economic circumstances (Jaksa et al., 2023). This is also supported by empirical evidence from East Teluk Jambe, which demonstrated that individuals with stronger confidence in their capabilities had a sevenfold higher probability of maintaining compliance [8]. These findings suggest that confidence in one's ability to fulfil administrative and financial obligations may facilitate compliance, although its independent contribution may be reduced when other HBM constructs are considered simultaneously.

Theoretically, self-efficacy refers to an individual's belief in their capability to successfully perform a required course of action (Glanz et al., 2015). In the context of national health insurance, self-efficacy may help individuals manage perceived financial and administrative barriers and translate intentions into actual payment behaviour. However, the lack of an independent association in the multivariate model suggests that self-efficacy alone may be insufficient to ensure JKN contribution compliance when stronger influences, particularly perceived vulnerability, perceived barriers, and cues to action, are simultaneously considered. Therefore, interventions may complement broader HBM-based strategies with practical financial literacy and technical guidance on accessible payment mechanisms. JKN cadres could provide practical assistance in financial planning and the use of digital payment platforms while reinforcing participants' confidence in their ability to maintain regular contributions.

The findings indicate that perceived vulnerability, perceived barriers, and cues to action were the key factors independently associated with JKN contribution compliance in the multivariate analysis. Perceived vulnerability showed the strongest positive association, whereas perceived barriers demonstrated an inverse association with compliance. These findings suggest that improving compliance requires a multidimensional approach that combines risk communication, reduction of financial and administrative barriers, and timely behavioural reminders. Importantly, because this study employed a cross-sectional design, the observed associations should not be interpreted as causal relationships. The findings identify factors associated with JKN contribution compliance rather than definitive determinants of compliance behaviour.

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design precludes causal inference regarding the relationships between HBM constructs and compliance behaviour because exposure and outcome were measured simultaneously and their temporal sequence could not be established. Second, data collection was limited to PBPU participants in a single regency, namely Tanggamus, which may limit the generalizability of the findings to other regions with different socioeconomic and geographic characteristics. Third, compliance status and HBM-related perceptions were assessed using self-reported questionnaires, which may be affected by social desirability and recall bias. Future research should employ longitudinal or experimental designs to clarify the temporal and causal pathways between psychosocial perceptions and JKN compliance, expand sampling across multiple regencies to improve generalizability, and triangulate self-reported information with administrative payment records to reduce reporting bias.

4. CONCLUSION

This study concludes that compliance with JKN contribution payments among Non-Wage Recipient Workers (PBPU) in Tanggamus Regency is significantly associated with several Health Belief Model constructs. Perceived vulnerability, perceived benefits, perceived seriousness, perceived barriers, and cues to action were significantly associated with compliance in the bivariate analysis, while perceived vulnerability, perceived barriers, and cues to action remained significant in the multivariate model. Perceived vulnerability emerged as the strongest predictor of compliance, whereas perceived barriers were negatively associated with compliance. These findings highlight the importance of strengthening PBPU participants' awareness of their vulnerability to health risks, reducing perceived barriers to contribution payments, and providing effective cues to encourage timely and sustained payment. Future studies should use longitudinal and intervention-based designs to examine temporal relationships further and evaluate strategies to improve JKN contribution compliance.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Ari Winarto contributed to the conception and design of the study, data collection, data analysis, interpretation of the findings, manuscript drafting, revision, and final approval of the version to be published. Endang Budiati contributed to the supervision of the study, methodological guidance, interpretation of the findings, and critical revision of the manuscript. Bambang Setiaji contributed to the supervision of the study, methodological guidance, review and interpretation of the findings, and critical revision of the manuscript. Atikah Adyas contributed to the critical review and evaluation of the manuscript and provided substantive comments and suggestions for improvement. Aila Karyus contributed to the critical review and evaluation of the manuscript and provided substantive comments and suggestions for improvement. All authors approved the final version of the manuscript for publication.

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DECLARATION OF ARTIFICIAL INTELLIGENCE USE

The author used an AI-assisted language tool (ChatGPT, OpenAI) solely to improve the language, grammar, readability, and organization of the manuscript. The AI tool was not used for data collection, data analysis, interpretation of results, or generation of scientific conclusions. The author takes full responsibility for the accuracy, originality, and integrity of the manuscript.

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