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The Relationship Between Knowledge Level and Social Media Use with Participation in the COVID-19 Vaccination Program in Pangkalan Kerinci Urban Village

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Abstract

Introduction: *COVID-19 vaccination represents a crucial public health strategy for controlling viral transmission by inducing protective immunity and reducing the severity of symptoms. Knowledge levels and social media exposure are among the factors that may influence individuals' willingness to participate in vaccination programs. This study aimed to analyze the relationships between knowledge level, social media use, and community participation in the COVID-19 vaccination program in Pangkalan Kerinci Kota Urban Village.* ***Methods:*** *An analytic, cross-sectional design was employed involving 106 residents aged 17–65 years selected through proportionate stratified random sampling and consecutive recruitment. Data were analyzed using the Chi-square test.* ***Results:*** *Most respondents demonstrated good knowledge regarding COVID-19 vaccination and reported frequent use of social media platforms. Statistical analysis revealed no significant relationship between knowledge level and participation in the vaccination program (p = 0.610) or between social media use and vaccination participation (p = 0.302).* ***Discussion:*** *The absence of significant associations suggests that vaccination uptake in this population may be influenced more strongly by structural or contextual factors, such as access to health services, trust in local authorities, and availability of vaccination sites, rather than by cognitive understanding or social media exposure alone. High knowledge levels and active social media use do not necessarily translate into health-seeking behavior, indicating a possible gap between awareness and action.* ***Conclusion:*** *Knowledge level and social media use were not significantly associated with participation in the COVID-19 vaccination program in Pangkalan Kerinci Kota Urban Village.*

Keywords: *COVID-19, vaccination, knowledge, social media.*

1. INTRODUCTION

Coronavirus Disease 2019 (COVID-19) is an infectious disease caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), first identified in December 2019 in Wuhan, China.[1] The disease is transmitted through respiratory droplets from infected individuals and presents with a broad spectrum of clinical manifestations, ranging from asymptomatic cases to severe illness.[2] COVID-19 rapidly evolved into a global pandemic. Since its emergence, the number of confirmed cases has increased dramatically worldwide, including in Indonesia, which recorded the highest mortality rate in Southeast Asia in 2021.[3]

Efforts to control the spread of COVID-19 have focused on implementing public health measures and large-scale vaccination programs. Vaccination is considered the most effective intervention for achieving herd immunity and reducing morbidity and mortality associated with COVID-19.[4] However, the success of vaccination programs largely depends on public acceptance, which, as shown in several studies, is influenced by levels of knowledge and access to reliable information.[5]

In this context, social media plays a dual role, serving both as a source of information and a channel for the dissemination of misinformation. On the one hand, social media can enhance public awareness and willingness to participate in vaccination programs through educational campaigns; on the other hand, it can also serve as a conduit for misinformation and conspiracy theories that may contribute to vaccine hesitancy or refusal.[6,7] A survey conducted by the Indonesian Ministry of Health in collaboration with WHO and UNICEF in 2020 reported persistent vaccine hesitancy among the public, particularly among low-income groups with limited access to credible information.[8]

Previous studies have shown associations between knowledge levels and participation in COVID-19 vaccination programs, as well as the influential role of social media as a primary source of vaccine-related information.[9,10] Nevertheless, findings across studies remain inconsistent, and empirical evidence from smaller urban communities in Indonesia is still limited. This gap is particularly important given that local sociocultural contexts, access to health services, and information environments may substantially influence vaccination behavior.

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Therefore, understanding how knowledge and social media use interact to shape vaccination participation at the community level is essential for informing more targeted and effective public health strategies. Evidence derived from localized settings can support the development of context-sensitive communication approaches, strengthen trust in health authorities, and optimize vaccination outreach efforts, especially in communities where vaccine uptake remains suboptimal. Accordingly, the present study aims to analyze the relationships among knowledge level, social media use, and public participation in the COVID-19 vaccination program in Pangkalan Kerinci Urban Village, Pelalawan Regency, Riau Province.

2. METHODS

Study Design

This analytical study employed a cross-sectional design to examine the association between knowledge level and social media use with community participation in the COVID-19 vaccination program in Pangkalan Kerinci Urban Village, Pelalawan Regency, Riau Province. All variables were measured simultaneously at a single point in time. The study was conducted offline between June and August 2023 in Pangkalan Kerinci Urban Village. Ethical approval was obtained from the Health Research Ethics Committee, Faculty of Medicine, Universitas Riau (Approval No. 296/UN.16.2/KEP-FK/2023).

Population and Sample

The study population consisted of all residents of Pangkalan Kerinci Urban Village. Participants were selected using inclusion criteria that required individuals to be willing to participate by signing an informed consent form, aged 17-65 years, and to have received at least one dose of the COVID-19 vaccine. Exclusion criteria were applied to respondents who provided incomplete questionnaire data, were unable to receive vaccination due to medical contraindications, or did not possess a valid COVID-19 vaccination certificate.

Sample Size and Sampling Technique

The minimum required sample size was calculated using the Lemeshow formula with a 95% confidence level and a tolerable error of 0.01, resulting in a minimum of 96 respondents. Sampling was conducted using a combination of cluster random sampling and proportionate stratified random sampling. Pangkalan Kerinci Urban Village is administratively divided into three neighborhoods, each with a varying population size: 11,692 residents in Neighborhood 1, 15,641 in Neighborhood 2, and

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7,765 in Neighborhood 3. Based on a proportional distribution, 35 respondents were selected from Neighborhood 1, 48 from Neighborhood 2, and 23 from Neighborhood 3, resulting in a total of 106 participants. The selection of neighborhoods (RW) and sub-neighborhoods (RT) was carried out randomly using the Spin the Wheel application. Within the selected clusters, respondents were recruited consecutively until the desired sample size was achieved, according to the inclusion criteria.

Study Variables

This study included two independent variables, level of knowledge regarding COVID-19 vaccination and social media use, and one dependent variable: participation in the COVID-19 vaccination program. The knowledge level variable was assessed using a 15-item questionnaire, and the total score was categorized as good (76–100%), moderate (56–75%), or poor (<55%) according to the percentage of correct responses. Social media use was determined using a single-item question about social media platforms, classified as user (engaged with at least one platform) or non-user (no engagement with any platform). Participation in vaccination was evaluated based on questionnaire responses and verification through vaccination certificates, categorized as mandatory vaccination (having received at least one dose) or booster vaccination (completion of two required doses and at least one booster dose).

Instrument Validity and Reliability

Instrument validity was tested on 30 respondents using the Corrected Item–Total Correlation method, with a critical r-value threshold of 0.3061. Of the 20 questionnaire items tested, 13 were deemed valid. Reliability testing was performed using Cronbach's Alpha, and all valid items demonstrated alphas greater than 0.60 ($\alpha = 0.664$), indicating that the questionnaire was reliable and internally consistent for data collection.

Data Analysis

Data analysis was performed using SPSS version 25.0 (IBM Corp., Armonk, NY, USA). Univariate analysis was used to describe the demographic characteristics of respondents and the distribution of each variable. Bivariate analysis was then conducted to assess the relationships between knowledge level and social media use, as well as between these factors and participation in the COVID-19 vaccination program, using the Chi-square test. A p-value of less than 0.05 was considered statistically significant.

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3. RESULTS

Table 1 presents the demographic characteristics of the study participants. Most respondents were female, accounting for 52.8% of the total sample. Educational attainment varied, with most participants having completed senior high school (61.3%, n = 65). Regarding occupation, 74.5% (n = 79) of respondents were employed, and the most common type of employment was self-employment or trading (29.2%, n = 31). The vast majority of participants were Muslim (93.4%, n = 99), while 6.6% (n = 7) identified as Protestant Christian. Regarding age distribution, the largest proportion of respondents fell within the 17–25-year age group (34.9%, n = 37).

Table 1. Demographic Characteristics of Respondents.

Characteristics	n	%
Sex		
Male	50	47.2
Female	56	52.8
Education Level		
Primary School	4	3.8
Junior High School	5	4.7
Senior High School	65	61.3
Higher Education	32	30.2
Occupation		
Civil Servant	12	11.3
Self-employed / Trader	31	29.2
Private Employee	20	18.9
Laborer	3	2.8
Farmer	1	0.9
Student	12	11.3
Unemployed	27	25.5
Religion		
Muslim	99	93.4
Non-Muslim	7	6.6
Age Group (years)		
17–25	37	34.9
26–35	25	23.6
36–45	25	23.6
46–55	15	14.2
56–65	4	3.8

Analysis of respondents' knowledge regarding the COVID-19 vaccine indicated that most participants answered correctly on most questions (Table 2). Specifically, 93.4% of respondents were aware of the method of vaccine administration (Q1), and 66.0% understood how the vaccine works (Q2). However, only 49.1% knew the correct schedule between the first and second doses (Q3). A total of 61.3% correctly identified which reactions were not considered post-vaccination side effects (Q4), and 74.5% recognized the name of the mobile application used to display vaccination status (Q5). Additionally, 62.3% of respondents knew the recommended interval for receiving the next vaccine dose after recovering from COVID-19 (Q6), and 57.5% were aware that vaccination is also recommended for children (Q7). A total of 60.4% understood the eligibility criteria for vaccination (Q8), while 92.5% correctly identified the vaccination locations (Q9). Knowledge regarding vaccine brands (Q10) and authorized vaccination personnel (Q11) was reported by 60.4% and 66.0% of respondents, respectively. Furthermore, 61.3% were aware of vaccination guidelines for individuals with a prior history of COVID-19 infection (Q12), and 58.5% understood the appropriate action to take if a

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potential vaccine recipient had a fever (Q13).

Table 2. Distribution of Respondents' Knowledge Regarding the COVID-19 Vaccine

Question (Knowledge Item)	Correct n	Percentage %
Q1	99	93.4
Q2	70	66.0
Q3	52	49.1
Q4	65	61.3
Q5	79	74.5
Q6	66	62.3
Q7	61	57.5
Q8	64	60.4
Q9	98	92.5
Q10	64	60.4
Q11	70	66.0
Q12	65	61.3
Q13	62	58.5

The distribution of knowledge levels among respondents showed that most participants demonstrated a good level of knowledge (75.5%, n = 80), followed by moderate (10.4%, n = 11) and poor (14.2%, n = 15). The distribution of vaccination participation across these categories indicated that among respondents with inadequate knowledge, 73.3% (n = 11) received only the mandatory vaccine doses, while 26.7% (n = 4) received booster doses. Among those with moderate knowledge, 54.5% (n = 6) had completed the mandatory vaccination series, and 45.5% (n = 5) had received booster doses. In contrast, among participants with good knowledge, 65.0% (n = 52) received mandatory doses, and 35.0% (n = 28) received booster vaccinations. Bivariate analysis using the Chi-square test revealed no statistically significant association between knowledge level and vaccination participation (p = 0.610, p > 0.05) (Table 3). This finding suggests that although the majority of respondents had adequate to good knowledge of COVID-19 vaccination, this knowledge did not significantly influence their level of participation in the vaccination program.

Table 3. Association Between Knowledge Level and COVID-19 Vaccination Participation.

Knowledge Level	Mandatory n (%)	Booster n (%)	p-value
Poor	11 (73.3)	4 (26.7)	**0.610**
Moderate	6 (54.5)	5 (45.5)	
Good	52 (65.0)	28 (35.0)	
Total	69 (65.1)	37 (34.9)	

Univariate analysis revealed that most respondents (85.8%, n = 91) reported using social media, while a smaller proportion (14.2%, n = 15) did not use any social media platforms. Regarding vaccination participation, among non–social media users, 53.3% (n = 8) received only the mandatory vaccine doses and 46.7% (n = 7) received booster doses. Among social media users, 67.0% (n = 61) received mandatory vaccinations and 33.0% (n = 30) received booster doses. Bivariate analysis using the Chi-square test showed that the association between

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social media use and vaccination participation was not statistically significant (p = 0.302, p > 0.05) (Table 4). These results suggest that, although the majority of respondents actively used social media, their participation in the COVID-19 vaccination program was not significantly influenced by their level of social media engagement or exposure to vaccine-related content.

Table 4. Association Between Social Media Use and COVID-19 Vaccination Participation.

Social Media Use	Mandatory n (%)	Booster n (%)	p-value
Non-user	8 (53.3)	7 (46.7)	0.302
User	61 (67.0)	30 (33.0)	
Total	69 (65.1)	37 (34.9)	

4. DISCUSSION

The results of this study indicate that the majority of respondents were female, aged 17–25 years, and had completed senior high school. These findings suggest that younger individuals with a secondary education background play a substantial role in COVID-19 vaccination participation in Pangkalan Kerinci Urban Village. This aligns with previous studies, which report that individuals in the productive age group are generally more active in engaging with public health programs due to greater access to information and higher social mobility.[11,12] Educational attainment also influences individuals' ability to comprehend health-related information, including that regarding COVID-19 vaccination. Most respondents demonstrated a good level of knowledge about the COVID-19 vaccine, particularly regarding its purpose, mechanism of action, and vaccination schedule. However, the bivariate analysis showed no statistically significant association between knowledge level and COVID-19 vaccination participation (p = 0.610). This finding is consistent with previous studies suggesting that knowledge alonep does not necessarily translate into health-related behaviors.[13,14] Other factors, such as personal experience, perceived side effects, and trust in health institutions, also contribute to an individual's decision to get vaccinated.

Conversely, other studies have reported a significant association between knowledge and participation in vaccination.[15] These discrepancies may be attributed to differences in demographic characteristics, healthcare access, and patterns of information exposure across populations. Within the framework of Lawrence Green's Health Behavior Theory, health behavior is shaped by the interaction of predisposing factors (such as knowledge and attitudes), enabling factors (including access to vaccination services and supportive policies), and

reinforcing factors (such as social support and trust in health authorities).[16] The present findings support a model in which enabling and reinforcing factors may outweigh or mitigate the influence of predisposing factors, suggesting that adequate access, policy-driven facilitation, and social reinforcement can sustain vaccination participation even when knowledge alone does not translate into action.

The present study found no significant relationship between social media use and participation in COVID-19 vaccination ($p = 0.302$). Although most respondents reported using social media as an information source, general or frequent use did not necessarily translate into higher vaccination uptake. Social media functions as a powerful channel for rapid information dissemination; however, it is simultaneously vulnerable to the spread of misinformation, conspiracy narratives, and unverified content, which may undermine public trust in vaccines.[17,18] This dual nature of social media may explain why its overall use was not associated with vaccination participation in the present analysis.

A recent narrative review involving Asian populations demonstrated that reliance on social media platforms for vaccine-related information was frequently associated with higher levels of vaccine hesitancy, with prevalence ranging from 20% to 55% across countries.[19] In multiple settings, exposure to misinformation and anti-vaccination narratives circulating on social media was linked to negative attitudes toward COVID-19 vaccines, delayed immunization, or reduced intention to vaccinate. Conversely, the same review also reported that social media exposure could enhance vaccination intention when information originated from official sources, healthcare professionals, or government-endorsed platforms, particularly in contexts characterized by strong policy enforcement and high institutional trust.

Taken together, these contrasting findings indicate that the impact of social media on vaccination behavior is highly context-dependent and influenced more by the quality, credibility, and framing of information than by mere exposure or frequency of use.[19,20] In the present study, social media use was assessed as a binary variable (user vs. non-user) without differentiating between pro-vaccine and anti-vaccine content or accounting for source credibility. This simplified measurement may have attenuated observable associations, as heterogeneous

information environments can produce opposing behavioral effects that neutralize one another.[19,20]

This study has several limitations. First, the cross-sectional design limits causal inference between the variables being studied. Second, social media use was measured using a single-item classification (user vs. non-user), which does not capture the quality, intensity, or orientation of vaccine-related exposure, such as pro- or anti-vaccine content, potentially influencing the results. Third, vaccination participation was assessed only among individuals who had received at least one COVID-19 vaccine dose, focusing on progression from mandatory to booster vaccination. Consequently, determinants of vaccine refusal were not evaluated, which may limit the generalizability of the findings. Lastly, the study was conducted in a single urban area, which may restrict its applicability to broader populations.

Continuous efforts from local governments and healthcare professionals are necessary to strengthen public understanding of COVID-19 vaccination through effective communication, public education, and the dissemination of accurate, easily accessible information via multiple media platforms, including social networks. Future studies are encouraged to include additional variables that may influence vaccination behavior, such as educational level, risk perception, family support, and access to healthcare facilities, to provide a more comprehensive understanding of the factors that determine vaccination participation.[20] Furthermore, longitudinal designs should be considered to evaluate behavioral changes and the long-term effectiveness of health communication interventions.

5. CONCLUSION

This study revealed that most respondents in Pangkalan Kerinci Urban Village had good knowledge of the COVID-19 vaccine, with the majority aged 17–25 and educated at the senior high school level. Nevertheless, no significant association was found between knowledge level and participation in the COVID-19 vaccination program. Similarly, there was no significant relationship between social media use and vaccination participation. These findings suggest that knowledge and exposure to information through social media are not the sole determinants of COVID-19 vaccination behavior. Other factors, such as attitudes, trust, social support, and governmental policies, likely play essential roles in influencing individuals' decisions to

participate in vaccination programs.

6. RECOMMENDATION

Strengthening access to vaccination services through improved availability, flexible scheduling, and strategically located sites is recommended to enhance participation in future programs. Community-based approaches involving local leaders and health cadres should be prioritized to build trust and encourage engagement beyond digital platforms. Direct communication methods, such as face-to-face counseling and community outreach, are also needed to bridge the gap between awareness and action. Further studies are encouraged to examine additional determinants, such as risk perception, institutional trust, and logistical barriers, that may influence vaccination uptake. Collaboration across sectors, including local governments, health facilities, schools, and community organizations, is essential to optimize participation and ensure the effectiveness of public health interventions.

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