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Supporting and Hindering Factors Associated with COVID-19 Health Protocol Adherence Among Online Motorcycle Taxi Riders in Samarinda City, Indonesia

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Abstract

The COVID-19 pandemic has underscored the importance of preventive health protocols, especially for high-contact occupations, such as online motorcycle taxi riders. However, adherence among these riders is inconsistent, particularly in economically constrained regions, such as Samarinda, a buffer zone for Indonesia's new capital. This study examined the influence of supporting and hindering factors on COVID-19 protocol compliance. A cross-sectional design was employed with 87 riders selected through quota sampling. Data were collected using structured questionnaires and analyzed using Spearman's rank correlation to assess the relationships between influencing factors and compliance levels. Economic barriers, especially high personal protective equipment (PPE) costs (46%), hindered protocol adherence, whereas supporting factors such as leadership and workplace-provided PPE showed no statistically impact on compliance. This finding suggested that financial constraints were the primary barrier, outweighing institutional support. Therefore, targeted financial assistance and strengthened public health policies are recommended to improve compliance. Enhancing community-level awareness and providing PPE subsidies could reinforce adherence and reduce transmission risk in high-contact occupations.

Keywords: COVID-19 preventive, health protocol compliance, hindering factors, online motorcycle taxi riders, supporting factors

Introduction

The coronavirus disease 2019 (COVID-19) pandemic has posed unprecedented challenges to global public health, necessitating the rapid adoption of preventive behaviors, such as mask-wearing, physical distancing, and frequent hand hygiene, to mitigate virus transmission.[1] For online motorcycle taxi riders, who frequently interact with passengers and the public, adherence to such measures is critical. In Samarinda City, Indonesia, where approximately 1,500 riders operate, recent surveys show only about 60% compliance with health protocols, placing both riders and passengers at risk.[2] A key barrier to adherence is the high cost of personal protective equipment (PPE), including masks, face shields, and sanitizers, which must be regularly replaced in high-contact jobs.[2] This economic burden is worsened by a lack of formal employment benefits, such as health insurance or PPE subsidies, leaving riders to cover these costs independently. For many, meeting immediate financial needs precedes health expenses, indicating the need to explore how socioeconomic factors affect preventive behavior in this high-risk, economically vulnerable group.

Online motorcycle taxi riders play a crucial role in urban mobility in the rapidly developing areas, serving as potential vectors for virus transmission if health protocols are inconsistently practiced. Previous studies have emphasized the importance of both economic and social influences on COVID-19 preventive behaviors across various occupational groups, including high-contact professions.[3–5] However, limited research has focused specifically on online motorcycle taxi riders, particularly in economically dynamic buffer zones such as Samarinda City.

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Promoting preventive behaviors among online motorcycle taxi riders involves understanding both supporting factors, such as access to PPE, workplace policies, and social encouragement from community leaders, as well as hindering factors, including financial burdens, limited resources, and competing social norms.[2,6] This study used a combination of self-reported data and direct observation to measure compliance, defining "preventive behaviors" as the consistent use of masks, maintaining social distance when possible, and carrying hand sanitizer for personal use. While awareness of COVID-19 risks is generally high among online motorcycle taxi riders, adherence remains challenging due to external pressures, especially economic constraints that require prioritizing income over health expenses.[2,6]

In this study, supporting factors included access to PPE, company policies mandating health protocol compliance, and social encouragement from workplace leaders. Conversely, hindering factors included economic pressures, limited access to sanitation resources, and social norms that may not prioritize health protocol compliance. Research from Ghana and Bangkok has shown that online motorcycle taxi riders with access to PPE and organizational support report higher compliance, whereas those facing economic hardship tend to show lower adherence rates.[1,7] This study was built on the findings of the examination of these factors within Samarinda City, a buffer zone transitioning to Indonesia's new capital. Unlike studies on other urban centers, this study highlighted how economic and environmental pressures in an emerging capital zone influence pandemic compliance, providing insights specific to riders in this dynamic environment. By comparing findings with urban riders in other socioeconomic settings, this research emphasized the importance of targeted economic support to bolster compliance in high-risk, high-contact professions.

Although public health campaigns and government regulations have increased awareness, practical obstacles persist, including high PPE costs, limited access to resources, and misinformation, particularly in settings where economic pressures are significant.[2,8] Previous studies on vulnerable worker groups emphasize that COVID-19 preventive behavior compliance depends on various factors, including knowledge, social support, and attitudes.[9,10] This suggests that a multifaceted approach combining education, economic support, and workplace policies is critical for achieving sustained preventive behavior.

While research on COVID-19 preventive behaviors across various worker groups is extensive, studies focusing specifically on online motorcycle taxi riders are limited. Most research has targeted traditional taxi riders or urban settings, overlooking the unique dynamics and socioeconomic pressures that online motorcycle taxi riders face in buffer zones such as Samarinda City. This study aimed to fill this gap by examining factors that either support or hinder protocol adherence in this high-contact occupation. This study explored the relationship between supporting and hindering factors and adherence to COVID-19 preventive behaviors among online motorcycle taxi riders in Samarinda City. The findings were expected to provide practical recommendations for effective public health interventions that address both the socioeconomic realities and the high-risk nature of this workforce, ultimately contributing to broader efforts in pandemic control.

Method

This study utilized a cross-sectional design to explore the association between supporting and hindering factors and COVID-19 preventive behaviors among online motorcycle taxi riders in Samarinda City in November 2022. Samarinda City was chosen because it is one of Indonesia’s largest provincial cities undergoing rapid urbanization, with a significant population of approximately 1,500 online motorcycle taxi riders. This context intensifies the public health relevance of compliance with the COVID-19 protocols in high-contact occupations.

A sample size of 87 riders was selected using quota sampling to represent the population. The sample size was calculated to maintain a 95% confidence level and a 10% margin of error, allowing for practical data collection within the scope of the study. Although a larger sample size would improve precision, the sample size was deemed sufficient to observe meaningful patterns.

Data were collected using a structured questionnaire developed specifically for this study to capture the relevant factors influencing COVID-19 preventive behavior adherence. The questionnaire was based on established research on health protocol adherence and was modified for relevance to online motorcycle taxi riders. It included sections on demographics, preventive behaviors, and supporting and hindering factors affecting compliance.[1] To ensure accessibility, the survey was distributed electronically via Google Forms and shared through WhatsApp groups among riders. Participation was voluntary, and all participants provided informed consent.

Spearman's rank correlation test was chosen for its suitability in assessing ordinal data without assuming a linear relationship. Correlation coefficients were interpreted to indicate the strength (weak, moderate, or strong) and direction

(positive or negative) of relationships, with coefficients close to +1 or -1 indicating strong associations and values near 0 suggesting weaker associations.[3]

To enhance the understanding of the study's purpose, procedures, and confidentiality measures, participants were provided with a clear explanation before participation. Respondents were informed of the minimal risks involved, such as potential discomfort in answering personal questions and benefits, including contributing to public health policies for occupational safety. Informed consent was obtained digitally from each participant before beginning the survey.

Results

The average age of the respondents was 32.39±8.07 years, indicating a moderate age distribution among participants. A high proportion of respondents (97.7%) demonstrated positive COVID-19 preventive behaviors, reflecting strong effort among riders to comply with health protocols (Table 1).

Table 1. Respondents' Characteristics

Variable	Frequency	%
Age (mean: 32.39±8.071 years)		
≤32 years	43	49.4
>33 years	44	50.6
Sex		
Male	76	87.4
Female	11	12.6
Education level		
Uneducated	1	1.1
Elementary school	6	6.9
Junior high school	6	6.9
Senior high school/vocational school	64	73.6
Higher education	10	11.5
Last education level		
Low	13	14.9
High	74	85.1
Length of employment		
≤2.3 years	45	51.7
>2.3 years	42	48.3
Supporting factors		
Low	55	63.2
High	32	36.8
Hindering factors		
Low	47	54
High	42	46
Preventive behavior		
Negative	2	2.3
Positive	85	97.7

Table 2 provides insights into COVID-19 transmission prevention behaviors among online motorcycle taxi riders. Overall, the data reflects high adherence to recommended preventive practices, with most respondents consistently engaging in behaviors such as maintaining physical distance (98.9%), wearing double masks (95.4%), washing hands with soap (94.3%), and avoiding contact with infected individuals (94.3%). These findings demonstrating a strong commitment to health protocols in this population. As shown in table 3, 38 respondents (43.7%) identified the high price of PPE as a key barrier to adhering to COVID-19 health protocols. Other hindering factors included poor access to handwashing facilities (25.3%) and limited government socialization efforts (24.1%). However, more than half of the participants did not perceive these factors as major obstacles. These results suggested that the affordability of PPE remains a substantial issue, potentially limiting compliance with preventive measures.

Table 2. COVID-19 Transmission Prevention Behavior

COVID-19 Transmission Prevention Behavior	Yes		No	
	n=87	%	n=87	%
Avoiding direct contact with others (such as shaking hands, touching, etc.)	77	88.5	10	11.5
Avoiding contact with people infected with COVID-19	82	94.3	5	5.7
Covering mouth when someone sneezes nearby	80	92	7	8
Not touching items that others have also touched (e.g., using non-cash payments, hanging items on a fence)	81	93.1	6	6.9
Wearing double masks (two masks/layered masks)	83	95.4	4	4.6
Using hand sanitizer when water and soap are unavailable	81	93.1	6	6.9
Washing hands with soap for 20 seconds	82	94.3	5	5.7
Avoiding crowds	81	93.1	6	6.9
Maintaining a distance of at least 1 meter from others when outside	86	98.9	1	1.1
Getting vaccinated (complete with 2 doses)	76	87.4	11	12.6
Regularly taking vitamins	77	88.5	10	11.5
Using a personal helmet	77	88.5	10	11.5
Wearing gloves	77	88.5	10	11.5
Regularly disinfecting a phone or vehicle	82	94.3	5	5.7
Regularly checking body temperature	78	89.7	9	10.3
Exercising regularly (5 days per week, 30 minutes)	86	98.9	1	1.1
Getting adequate sleep/rest	86	98.9	1	1.1

Table 3. Hindering Factors in the Implementation of Health Protocols by Online Motorcycle Taxi Riders

Statement	Yes		No	
	n	%	n	%
The price of masks, face shields, hand sanitizer, or other PPE is expensive	38	43.7	49	56.3
Difficulty in accessing handwashing facilities (water and soap) in the surrounding environment	22	25.3	65	74.7
Family or relatives do not provide support for implementing health protocols	16	18.4	71	81.6
Neighbors or the community do not provide support for implementing health protocols	16	18.4	71	81.6
Lack of socialization from the government or local COVID-19 task force regarding health protocol implementation	21	24.1	66	75.9

Access to hygiene facilities was also a challenge, albeit to a lesser degree. Approximately 25.3% of the respondents reported difficulty finding handwashing stations with water and soap in their environment, highlighting a structural barrier that could discourage regular handwashing, indicating that infrastructure gaps could discourage consistent hand hygiene practices. Social support from family and community members appeared to be less problematic for most riders. This condition indicated that most respondents did not perceive a lack of social encouragement as a primary barrier, suggesting that family and community attitudes toward health protocols are generally favorable. Another notable barrier was the perceived lack of government outreach or socialization efforts regarding health protocols. It highlighted a potential gap in public health communication, as a more proactive approach from authorities could reinforce the importance of health behaviors and provide additional motivation and guidance for compliance.

Table 4. Supporting Factors in the Implementation of Health Protocols by Online Motorcycle Taxi Riders

Statement	Yes		No	
	n	%	n	%
Supervisors or leaders set an example by implementing health protocols	82	94.3	5	5.7
There are penalties for not implementing health protocols	77	88.5	10	11.5
There have been COVID-19 cases in the surrounding environment	47	54	40	46
Health protocols are strictly enforced in the surrounding environment	77	88.5	10	11.5
Facilities to implement health protocols are provided at the workplace (temperature checks, masks, etc.)	80	92	7	8

Table 4 shows the factors influencing health behavior changes when adapting to new COVID-19 preventive habits. The data indicated that leadership and workplace support significantly impact adherence to health protocols. "Leaders" primarily refer to supervisors or coordinators associated with the ride-hailing platform or local operational team. These may include team coordinators, platform representatives, or senior riders, who guide new riders on safety practices and promote compliance with health protocols. Because riders are generally independent contractors, these leaders provide support and guidance rather than traditional managerial oversight, emphasizing health practices without the authority of direct supervision.

Penalties for non-compliance also served as a strong motivator, with 88.5% of riders acknowledging that sanctions were in place for those who did not adhere to health protocols. This result suggested that enforcement mechanisms help ensure that riders took preventive measures seriously. Access to workplace-provided facilities was another crucial support factor, with 92% of respondents indicating that their workplace offers tools, such as temperature checks and masks. This accessibility likely reduced barriers to compliance as riders could conveniently access essential protective equipment, which can enhance their adherence to health protocols. Interestingly, only 54% of respondents reported

COVID-19 cases in their immediate environment, which means that the presence of cases nearby was not a strong motivator. However, this still represented the majority, suggesting that awareness of local COVID-19 cases might play a role in reinforcing the importance of following health protocols.

Table 5. Relationship of Supporting and Hindering Factors with COVID-19 Prevention Behavior

Variable	COVID-19 Transmission Prevention Behavior				Total		Sig.
	Negative		Positive				
	n	%	n	%	n	%	
Supporting Factor							
Low	1	1.8	54	98.2	55	100	1.000
High	1	3.1	31	96.9	32	100	
Hindering Factor							
Low	2	4.3	45	95.7	47	100	0.547
High	0	0	40	100	40	100	

Note: The "high hindering-negative behavior" category contains zero respondents, leading to a zero-cell issue.

Table 5 shows the relationship between the supporting and hindering factors and COVID-19 prevention behavior. Respondents with both low and high levels of supporting factors exhibited similarly high compliance rates (98.2% and 96.9%, respectively), with no statistically significant relationship (p-value = 1.000). Similarly, while hindering factors, such as high PPE costs, were expected to decrease compliance, the analysis showed no significant relationship between hindering factors and preventive behavior (p-value = 0.547). A zero-cell issue was identified in the "high hindering-negative behavior" category, where no respondents with high hindering factors exhibited negative preventive behavior. This issue reflected the limited variability in the dataset, potentially arising from high overall compliance among respondents. Although this could suggest a resilience mechanism, it also limited the robustness of the statistical analysis.

Discussion

This study showed no significant relationship between COVID-19 preventive behaviors and supporting factors. These results suggested that institutional support, such as leadership guidance and workplace-provided PPE, may not strongly influence adherence among online motorcycle taxi riders in Samarinda City. While leadership modeling and workplace-provided PPE were present, these measures alone did not suffice to drive compliance among economically constrained workers, such as online motorcycle taxi riders. To meet the study's aim, it is necessary to examine socioeconomic realities more critically. Riders expressed that workplace-provided PPE was sporadic or insufficient, requiring them to purchase replacements independently. Additionally, leadership examples, while impactful in fostering awareness, lacked reinforcement through tangible economic or policy support. Thus, riders perceived these supportive measures as helpful but inadequate in addressing their fundamental financial barriers, such as high PPE costs.

In contrast to previous studies that emphasized the strong influence of supporting factors,[1,3] the findings from Samarinda City indicated that personal motivation and risk awareness were the primary factors in compliance. Practical recommendations must incorporate mechanisms to reduce economic pressure, such as implementing PPE subsidies and enhancing workplace provisions to complement existing institutional support. Policies promoting consistent PPE availability at subsidized costs or free distribution at key ride-hailing hubs would address driver needs more effectively. Moreover, targeted interventions that leverage community leaders or local organizations could amplify workplace efforts and ensure more comprehensive support systems for riders.

Misinformation from social media occasionally leads to complacency, emphasizing the need for consistent public awareness campaigns to maintain adherence to health protocols.[6] The findings from the previous study align with this study's results that external support, without strong internal motivation or a high perceived risk of infection, may have limited effectiveness. In Samarinda City, where rapid urban development influences socioeconomic dynamics, riders may similarly prioritize economic needs, relying less on external cues or institutional support.

This study's findings further indicated that COVID-19 cases within the community and workplace-provided resources alone were insufficient indicators of protocol adherence. These results are consistent with other research findings emphasizing that social support and infrastructure provision can enhance compliance, but only when combined with strong policy enforcement and individual motivation.[11,12] In contrast, a study in Surabaya City, Indonesia, asserted that compliance remains low without strict policies and substantial environmental support, even when COVID-19 cases occur. This disparity suggests that policy rigor and perceived enforcement may play a more influential role in motivating compliance than the availability of supportive resources.[13] This highlights the importance of regulatory enforcement

along with supportive measures to ensure consistent compliance. The implications of these findings underscore that while workplace support, such as leadership modeling and access to PPE, can be beneficial, it is not sufficient to guarantee adherence among riders. Consistent with the literature, these results suggest that individuals may lack motivation to fully adhere to health protocols without robust policies and strong environmental support, even when COVID-19 cases are prevalent around them.[12,13]

According to Social Cognitive Theory (SCT), behavior change is influenced by reciprocal interactions among personal, environmental, and behavioral factors, suggesting that workplace support is part of a larger social context that impacts adherence.[14-16] The findings of this study suggested that SCT principles may not predictably lead to behavioral change in settings where financial and personal motivations overshadow external support. Psychological and behavioral interventions, along with company policies, could support compliance by fostering better health practices among riders.[14] Supporting factors such as role modeling by leaders, implementation of penalties for non-compliance, exposure to local COVID-19 cases, strict enforcement of preventive measures, and workplace facilities for health protocol adherence belong to the environmental domain and can encourage new habit formation among online motorcycle taxi riders.[15,16] However, the findings of this study suggested that these external supports may be insufficient in driving behavior change among economically constrained populations without addressing personal and economic motivators.

Expanding on individual influences, recent studies has underscored the role of health literacy in adherence to health protocols. Higher health literacy allows individuals to understand and act on health information effectively, promoting preventive behaviors.[17,18] Interpersonal and community factors also play a significant role in shaping COVID-19 prevention behaviors. Research indicates that supportive environments, including family and community backing, help stabilize and strengthen individuals' commitment to preventive actions.[19,20] This suggests that community-driven interventions promoting social support and peer adherence may enhance compliance among online motorcycle taxi riders.

Finally, psychological factors are crucial in motivating preventive behaviors. According to the Health Belief Model, perceptions of susceptibility and severity influence preventive behaviors.[21,22] However, while perceived risk can encourage adherence, supportive environments and behavioral modeling are necessary to sustain it. For riders, practical support combined with effective risk communication may foster a balanced approach to preventive behaviors.

The relationship between supporting factors and COVID-19 prevention behavior is complex and involves individual, interpersonal, and community interactions. Enhancing adherence among riders may require interventions that not only provide workplace resources but also address personal motivations, psychological resilience, and social support networks. Future strategies should adopt a multifaceted approach integrating economic support, health literacy programs, and community engagement to foster sustained compliance in high-risk occupational settings. This approach aligns with SCT's emphasis on addressing both internal motivations and external support to enhance preventive behaviors in high-contact professions.

The analysis in this study revealed no significant relationship between COVID-19 preventive behavior and the identified hindering factors. However, the zero-cell issue in the "high hindering-negative behavior" category highlights a limitation in data distribution. This absence may reflect the strong self-efficacy and motivation among riders who prioritize compliance despite economic barriers, such as high PPE costs. Alternatively, this may indicate insufficient sample diversity, which could obscure meaningful relationships. While the findings emphasized the resilience of riders, they also underlined the need for further investigation using larger and more diverse samples to avoid zero-cell issues. Advanced statistical techniques, such as logistic regression adjusted for covariates (e.g., education level, years of employment, and health beliefs), could provide deeper insights into the influence of hindering factors on preventive behavior.

To address socioeconomic realities comprehensively, public health interventions must prioritize direct economic support for this workforce. For example, government or corporate partnerships could establish financial assistance programs or insurance schemes for riders, thus offsetting the costs of protective measures. Beyond economic relief, education campaigns tailored to high-contact workers should integrate practical strategies for low-cost adherence, such as reusable masks or hand hygiene practices using accessible resources.

Psychological factors play a crucial role in determining adherence to preventive measures, as demonstrated in studies of perceived barriers and self-efficacy. A study in Sri Lanka found that individuals who perceive more barriers are less likely to engage in preventive behaviors.[23] Low self-efficacy is another major obstacle. An Iranian study emphasized that individuals with lower confidence in their ability to follow preventive behaviors are less likely to comply,

especially among those managing chronic conditions.[24] Although these psychological barriers are significant, riders in Samarinda City managed to prioritize COVID-19 protocols despite high PPE costs, possibly due to increased self-efficacy and personal motivation.

In alignment with findings in similar settings, this study indicates that economic barriers are substantial. However, they do not fully prevent compliance among high-risk workers. A previous study stated that although financial burdens impacted online motorcycle taxi riders' health behaviors, many riders prioritized preventive measures when they perceived the risks of COVID-19 to be high.[2] In other words, enhancing riders' risk awareness and providing ongoing health education could mitigate the impact of economic barriers on adherence. Conversely, these results differed from studies emphasizing the detrimental impact of economic barriers on protocol adherence. This study showed that Samarinda City riders continue to prioritize preventive behaviors, potentially due to strong personal motivation and self-efficacy. It further revealed that while economic challenges, such as high PPE costs, act as hindering factors, they do not entirely obstruct preventive behaviors. Although many riders considered PPE expensive, they still expressed intent to follow health protocols, motivated by risk awareness and community protection.[25,26] This aligned with research showing that higher health literacy, COVID-19 risk awareness, and workplace social support significantly enhance protocol adherence.[27,28]

Adapting to new health habits involves adjusting individuals' behaviors and lifestyles to meet health protocol requirements, especially for disease prevention. Research stated that various factors, such as health knowledge, supportive behaviors, adherence to health guidelines, and family support, influence this adaptation process.[29–31] However, time constraints, work conditions, and negative perceptions of health measures can be hindering factors, particularly in maintaining behaviors like handwashing.[25,32] Policies that support these behaviors, including handwashing, are essential for sustaining public health.[31]

In contrast, studies indicate that strict policies and consistent enforcement are necessary for high compliance, particularly when internal motivation is lacking. For example, a 2021 survey by Statistics Indonesia found that adherence to mask-wearing and travel restrictions was largely due to government mandates, which required mask usage in public spaces and promoted health education through mass media.[7,33] While social support and awareness are valuable, policy enforcement is essential for consistent compliance, especially in urban and buffer zones, such as Samarinda City.

Additionally, SCT emphasizes the role of the social environment, including interactions with peers and customers, in influencing adherence to health protocols. In this study, driver compliance may be affected by interactions with both customers and peers, who can either reinforce or diminish the perceived importance of protocols. Riders who observe compliance among peers are more likely to follow suit, while observing non-compliance may reduce their motivation to adhere.[14] Ensuring a supportive social environment with reliable and consistent health messaging is essential to maintaining preventive behaviors among riders, particularly given social media's impact on perceptions.[34] Social media plays a crucial role in disseminating health information, particularly to younger populations, highlighting the importance of accurate and consistent messaging. A previous study noted that higher education and supportive policies are associated with better workplace protocol adherence, a strategy that could benefit ride-hailing riders.[33]

The strength of this study laid in its focus on high-risk, economically vulnerable riders in Samarinda City, which provides insights into the specific hindering factors faced in this buffer zone. However, several limitations of this study should be addressed in future studies. First, the zero-cell issue in the "high hindering-negative behavior" category restricts the interpretability of the results, as no respondents in this group reported negative preventive behavior. This limitation, likely stemming from the small sample size and high overall compliance, suggests that the findings may not fully capture the relationship between hindering factors and preventive behaviors. Future research should address this issue by increasing the sample size and ensuring greater variability among respondents. Second, the study did not adjust for potential confounding variables such as education level, years of employment, and health beliefs, which may influence the relationships between factors and compliance. The use of multivariable regression in future studies could provide a clearer picture of these dynamics.

Despite these limitations, the findings offer valuable insights into the challenges faced by online motorcycle taxi riders in adhering to COVID-19 protocols and suggest practical recommendations for addressing economic and institutional barriers. Future interventions should address these hindering factors using a multifaceted approach that includes economic support, such as PPE subsidies, enhanced health education, and consistent enforcement of protocols. Combining economic support with public education and policy reinforcement in alignment with SCT principles may be the most effective way to sustain preventive behaviors among online motorcycle taxi riders in similar high-contact, high-

risk professions.

Conclusion

This study concludes that while online motorcycle taxi riders in Samarinda City demonstrate high levels of positive attitudes toward COVID-19 preventive behaviors, economic barriers, particularly the high cost of PPE, significantly hinder consistent adherence. These findings underscore the need for public health interventions to extend beyond awareness campaigns and institutional support. Addressing socioeconomic realities through targeted economic assistance programs, such as subsidized PPE distribution or financial relief packages, is critical for sustaining compliance among high-risk, economically vulnerable groups. Moreover, strengthening workplace policies with tangible and enforceable measures, such as guaranteed PPE provision, could enhance institutional support. By integrating these recommendations, this study provides actionable pathways for pandemic control efforts, aligning its findings with the study's aim to offer practical solutions. These interventions not only mitigate socioeconomic barriers but also foster a resilient, health-conscious workforce capable of maintaining preventive behaviors in high-contact occupations.

Abbreviations

COVID-19: coronavirus disease 2019; PPE: personal protective equipment; SCT: Social Cognitive Theory.

Ethics Approval and Consent to Participate

This study was approved by the Medical and Health Research Ethics Committee of the Faculty of Medicine, Mulawarman University (217/KEPK-FK/XI/2023).

Competing Interest

There are no conflicts of interest.

Availability of Data and Materials

The datasets generated and analyzed during the current study are not publicly available because of privacy or confidentiality concerns but are available from the corresponding author upon reasonable request.

Authors' Contribution

DLS: Concepts, design, definition of intellectual content, literature search, data acquisition, data analysis, statistical analysis, manuscript preparation, manuscript editing, manuscript review. IK: Definition of intellectual content, literature search, data acquisition, data analysis, manuscript editing, manuscript review. TA: Design, data acquisition, manuscript editing, and manuscript review. RTA: design, data acquisition, manuscript editing, data analysis.

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