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# Building community resilience to covid-19: an interprofessional collaborative model

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**ABSTRACT**

**Introduction:** Coronavirus Disease 2019 (COVID-19) is a significant global health issue, requiring vigilance and adherence to health protocols to prevent transmission. This study aimed to develop an interprofessional collaborative model based on community sectoral coordination.

**Methods:** A mixed-methods explanatory research design was employed, involving 934 respondents selected through convenience sampling. The research instrument was a modified version of a validated and reliable questionnaire covering interprofessional collaboration, community health nursing, alertness, compliance, and resilience. The data was analyzed using Partial Least Squares (PLS) to test the model's fit and predictive relevance.

**Results:** The coefficient of determination ($R^2$) was 0.772, indicating that 77.2% of the variance in interprofessional collaborative community sectoral coordination could be explained by individual, team, task, and work structure characteristics, as well as community leaders and cross-sectoral factors. The remaining 22.8% was attributed to other variables not included in this study. The Predictive Relevance ($Q^2$) value was greater than 0, suggesting that the model was adequately predictive. Significance testing showed that the exogenous variables had a significant impact on endogenous variables with a total T-statistics value of 1.96 or P value <0.05.

**Conclusions:** The developed interprofessional collaborative model based on community sectoral coordination significantly enhances community alertness, compliance, and resilience, contributing to the achievement of COVID-19 herd immunity.

**Keywords:** community health planning, covid-19, health knowledge, interprofessional relations, patient compliance, resilience

## Introduction

The COVID-19 pandemic has had a profound impact on global health, economies, and societies (Fernandes, 2020). While the acute phase of the pandemic has subsided, the lingering effects of the pandemic, including long COVID, mental health challenges (Barzilay *et al.*, 2020), and health disparities, continue to demand attention (Nursalam *et al.*, 2020). Additionally, the threat of future pandemics necessitates ongoing vigilance and preparedness (Binnicker, 2020). Throughout the pandemic, healthcare systems worldwide experienced immense strain, with healthcare workers facing unprecedented workloads and risks. The pandemic also highlighted existing health inequities (Elam-Evans *et al.*, 2020) and the need for stronger community engagement in public health initiatives (Cheng *et al.*, 2020).

In response to these challenges, interprofessional collaboration emerged as a critical strategy for improving healthcare delivery, building community resilience (Inchausti *et al.*, 2020), and addressing the complex needs of populations affected by COVID-

19. Interprofessional collaboration refers to the joint efforts of diverse healthcare specialists, such as doctors, nurses, and pharmacists, working together to improve patient outcomes. While this approach has been studied in various healthcare contexts, its specific application to the context of community-based strategies as part of a pandemic response remains largely unexplored. This gap in understanding highlights the need for models that effectively integrate interprofessional teamwork with coordination across community sectors to strengthen resilience during pandemic crises.

Community sectoral, also known as community sectoral coordination, involves the joint efforts of various sectors such as healthcare, local government, and community groups to deliver a cohesive public health response. Research during the COVID-19 crisis demonstrated that effective coordination among these sectors enhanced the allocation of public health resources and communication, leading to greater compliance with health guidelines and strengthened community resilience (Ekezie *et al.*, 2023). Further empirical research is required to evaluate how this coordination can foster long-term resilience and readiness for future disease outbreaks.

Resilience, defined as the capacity of communities to endure and bounce back from adversities, is crucial during crises. Key factors in fostering this resilience include robust social connections, capable leadership, and cooperative efforts, particularly in the face of a pandemic. In the case of COVID-19, resilient communities demonstrate improved compliance with health guidelines, quicker adjustment to evolving circumstances, and more robust networks of social assistance. It is essential to comprehend how interdisciplinary teamwork and coordination across sectors contributes to enhancing resilience as this knowledge is vital for enhancing public health interventions.

Compliance with public health guidelines, including the use of face coverings, maintaining physical distance, and getting vaccinated, has played a crucial role in controlling the spread of COVID-19. Higher rates of compliance are strongly linked to reduced virus transmission but adherence is influenced by various elements such as strong leadership, transparent communication, and public confidence in healthcare professionals. Our research aims to explore these factors to determine how collaboration across different healthcare disciplines can enhance compliance and boost the overall efficacy of efforts to combat the pandemic (Elam-Evans *et al.*, 2020).

Recent studies have underscored the crucial role of community engagement and interprofessional collaboration in pandemic preparedness and response. A systematic review published in 2023 found that community engagement interventions led to significant improvements in COVID-19 vaccine uptake and adherence to public health measures (Ekezie *et al.*, 2023). Additionally, a 2022 survey of healthcare professionals revealed that 85% believed interprofessional collaboration was essential as part of an effective pandemic response, citing improved communication, resource sharing, and problem-solving as key benefits (Jordan, Connors and Mastalerz, 2022). These findings underscore the need for models that effectively integrate community engagement and interprofessional collaboration to enhance resilience to current and future health crises.

This research proposes a novel interprofessional collaborative model that integrates community sectoral coordination to enhance the resilience to COVID-19 and future pandemics. By fostering collaboration between healthcare professionals, community leaders, and other stakeholders, this model aims to improve communication, coordination, and resource allocation, ultimately leading to better health outcomes and stronger, more resilient communities.

## Materials and Methods

### Research Design

This study employed an explanatory cross-sectional design to examine the relationships between individual characteristics, team dynamics, task specifics, work structure, interprofessional collaborative-based community sectoral coordination, and community awareness, compliance, and resilience. The selected variables are based on a combination of theoretical frameworks and empirical studies that highlight their relevance to healthcare collaboration and pandemic response.

The first variable is team dynamics. Effective collaboration within healthcare teams is often determined by team structure, leadership, and cohesiveness. Studies have shown that strong leadership and mutual respect among team members enhances performance, particularly in high-pressure environments such as during a pandemic response (Wang *et al.*, 2020). This variable was selected to assess how well-functioning teams contribute to successful community health outcomes.

The second variable is task specifics. The nature of tasks, including their complexity and clarity, has been found to influence how well teams collaborate. Clear role definitions and task delegation are crucial for interprofessional collaboration, especially in emergency settings like the COVID-19 pandemic (Lai *et al.*, 2020). This study builds on these findings by examining how task-related factors influence team and community performance.

The third variable is work structure. The organization of work tasks, communication channels, and norms within teams are essential components of collaborative

efforts. Research has highlighted that well-structured teams with clear communication pathways are better equipped to handle crises, as they facilitate quick decision-making and effective action (Jordan *et al*., 2022). This variable was selected to understand its role in enhancing collaboration.

The fourth variable is interprofessional collaborative-based community sectoral coordination. This variable was chosen to assess how collaboration across different sectors — such as healthcare, government, and community organizations — can improve public health responses. The importance of sectoral coordination was highlighted during the COVID-19 pandemic, where communities with strong cross-sector collaboration showed better resilience and compliance with health measures (Cheng *et al*., 2020). This aligns with the need for interprofessional and cross-sector efforts to address complex health challenges.

The last variable is community awareness, compliance, and resilience. These outcome variables are key indicators of how well communities adapt to health crises. Compliance with public health measures and resilience to ongoing challenges have been identified as critical factors mitigating the impact of pandemics (Inchausti *et al*., 2020). Studies have shown that community awareness and engagement are crucial for promoting the adherence to health protocols (Ekezie *et al*., 2023).

## Data Collection

Data were collected using a structured questionnaire administered between September to October 2024. The research team approached nurses who met the inclusion criteria, and their willingness to participate was confirmed. Participants were introduced to the study's objectives and methods, followed by the distribution of an informed consent form. Once consent was obtained, participants completed the questionnaire independently or with the researcher's assistance if needed. Therefore, researchers and enumerators received training on the study protocol, data collection tools, and ethical considerations. The data collection instrument used was a standardized and validated questionnaire, ensuring the accuracy of the collected data. The questionnaire took approximately 25-30 minutes to complete. The researchers conducted data checks during the data collection to identify incomplete data and erroneous entries. Researchers addressed any questions from participants during data collection to ensure clarity and completeness.

## Population, Sample, and Sampling

The study population consisted of individuals from the general population of Java, Indonesia, specifically focusing on regions with high COVID-19 infection rates. The sample was not limited to healthcare professionals but included members of the community affected by the pandemic. The term "communities" refers to individuals living in regions severely impacted by COVID-19, including direct and indirect effects such as economic hardship, community disruptions, and participation in response efforts.

The inclusion criteria were as follows: (a) individuals from communities impacted by COVID-19 on the island of Java, (b) individuals aged 20 to 55 years old, representing the working-age population most likely to be involved in community response efforts, and (c) literate individuals, to ensure comprehension of the questionnaire. Community leaders and representatives were identified through local government and health agencies, and participants were recruited via direct invitation.

The sample size of 934 respondents was determined using the G*Power 3.1.9.2 software, and convenience sampling was employed. Recruitment focused on ensuring that the participants came from regions significantly affected by the pandemic, reflecting the collective involvement of the community in their pandemic response. The study did not exclusively target individuals who had been infected or healthcare workers treating COVID-19 patients; it included people from areas experiencing high infection rates and other pandemic-related impacts.

## Variables

The independent variables in this study were individual characteristics (X1) consisting of knowledge (X1.1), skills (X1.2), and attitudes (X1.3); team characteristics (X2) consisting of leadership (X2.1), team cohesion (X2.2), and communication (X2.3); task characteristics (X3) consisting of task complexity (X3.1), task clarity (X3.2), and role definition (X3.3); work structure (X4) consisting of task distribution (X4.1), communication processes (X4.2), and work norms (X4.3); community leader (X5) consisting of influence in decision-making (X5.1) and trust within the community (X5.2); and cross-sectors (X6) consisting of healthcare collaboration (X6.1), government involvement (X6.2), and civil society engagement (X6.3).

The dependent variables in this study were interprofessional collaboration based on community sectoral coordination (Y1) and herd immunity (Y2), reflecting the effectiveness of coordinated efforts and the achievement of community-wide immunity through public health interventions.

## Instrument

The research instrument was a modified version of the interprofessional collaborative, community health nursing, alertness, compliance, and resilience questionnaire, which had previously been tested for validity and reliability. Data collection was carried out both in person and online, ensuring data confidentiality

and after obtaining informed consent from all participants.

Individual characteristics (X1), comprising Knowledge (X1.1), Skills (X1.2), and Attitudes (X1.3), were measured using the PINCOM-Q (Perception of Interprofessional Collaboration Model Questionnaire) (Jörns-Presentati *et al.*, 2021; Jörns-Presentati and Groen, 2023). Team characteristics (X2), consisting of Leadership (X2.1), Team Cohesion (X2.2), and Communication (X2.3), were measured using the Team Effectiveness Questionnaire (Bateman, Colin Wilson and Bingham, 2002; Kilpatrick *et al.*, 2019). Task characteristics (X3), including Task Complexity (X3.1), Task Clarity (X3.2), and Role Definition (X3.3), were also measured using the Team Effectiveness Questionnaire (Bateman, Colin Wilson and Bingham, 2002; Kilpatrick *et al.*, 2019). Work structure (X4), comprising Task Distribution (X4.1), Communication Processes (X4.2), and Work Norms (X4.3), was measured using the Team Effectiveness Questionnaire (Bateman, Colin Wilson and Bingham, 2002; Kilpatrick *et al.*, 2019). Community leader (X5), represented by Influence in Decision-Making (X5.1) and Trust within the Community (X5.2), was measured using the Leadership Questionnaire (Du Preez and Van Zyl, 2015; Wilfinger, 2008). Cross-sectors (X6), including Healthcare Collaboration (X6.1), Government Involvement (X6.2), and Civil Society Engagement (X6.3), were assessed using a researcher-modified instrument that underwent validity and reliability testing, yielding an R-value between 0.526 and 0.722 and a Cronbach's alpha of 0.908. The dependent variables in this study included Interprofessional Collaboration Based on Community Sectoral Coordination (Y1), measured using the Community Sectoral Coordination Questionnaire (Nxumalo, 2013)Herd Immunity (Y2), reflected the effectiveness of coordinated efforts and the achievement of community-wide immunity through public health interventions.

The questionnaire was initially tested by distributing it to individuals affected by COVID-19 who were not part of the study but shared similar characteristics to the research subjects. The next step was to test the validity and reliability of the questionnaire to ensure that the data obtained was valid and consistent. The validity of each question was assessed by correlating each item's score with the total score using product-moment correlation. Questions were deemed valid if the corrected item-total correlation was equal to or greater than 0.25 to 0.30. Reliability was tested using computer software to calculate Cronbach's Alpha, with a Cronbach's Alpha value of 0.6 or higher being considered reliable.

### Ethical Clearance

Ethical approval for this research was obtained from the research ethics commission of the Health Research Committee of the Faculty of Nursing, Universitas Airlangga Surabaya (certificate number 2224-KEPK). The participants in this study were fully informed about their role in the data collection process, and their participation was entirely voluntary. They were made aware that they could decline to participate or withdraw from the study at any point without facing any negative consequences. Informed consent forms were provided to the participants, ensuring they had a clear understanding of the study and their involvement. These forms were signed as a formal indication of their approval to participate. The confidentiality of all participant data was strictly maintained, with assurances that the information collected would be used solely for research purposes and handled securely to protect their privacy.

### Data Analysis

The research involved both descriptive and inferential data analysis. Descriptive statistics, including frequencies, means, and standard deviations, were used to summarize and characterize the sample and key variables. Inferential analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the relationships between the latent variables and assess the model's predictive relevance.

PLS-SEM allows for the assessment of both the measurement model (outer model) and the structural model (inner model). The outer model was evaluated for convergent and discriminant validity using indicators such as Average Variance Extracted (AVE), composite reliability (Cronbach's alpha and rho_A), and Heterotrait-Monotrait ratio (HTMT). The structural model was assessed using R-squared values, the Stone-Geisser Q-square test for predictive relevance, and path coefficients with bootstrapping to determine the significance and strength of relationships between latent variables. Additionally, Variance Inflation Factor (VIF) was calculated to assess multicollinearity among the predictor variables.

A comprehensive table was presented to summarize the key findings of the PLS-SEM analysis, including the aforementioned model fit indices, reliability and validity measures, path coefficients, and VIF values. This provides a clear and concise overview of the model's performance and the relationships between the variables, facilitating the interpretation and discussion of the results.

## Results

This section presents the results of the study, focusing on the characteristics of the respondents, the evaluation of the measurement (outer) model and structural (inner) model, and the hypothesis testing. The analysis provides insights into the relationships between individual characteristics, team dynamics, and other key factors affecting interprofessional collaboration and herd immunity.

Table 1. Demographic Characteristics of the Respondents

| Indicator | Category | Frequency | Percentage (%) |
|---|---|---|---|
| Gender | Woman | 527 | 56.4 |
| | Man | 407 | 43.6 |
| Age | 25 - 31 Years | 451 | 48.3 |
| | 31 - 40 Years | 279 | 29.9 |
| | 41 - 50 Years | 123 | 13.2 |
| | > 50 Years | 81 | 8.7 |
| Religion | Islam | 578 | 61.9 |
| | Christian | 204 | 21.8 |
| | Hindu | 109 | 11.7 |
| | Buddha | 34 | 3.6 |
| | Confucius | 9 | 1.0 |
| Education | Diploma | 494 | 52.9 |
| | Bachelor | 307 | 32.9 |
| | Master | 109 | 11.7 |
| | Doctor | 24 | 2.6 |
| Work | Pharmacist | 209 | 22.4 |
| | Doctor | 178 | 19.1 |
| | Nutrition | 123 | 13.2 |
| | Nurse | 376 | 40.3 |
| | Therapist | 48 | 5.1 |
| Marital status | Married | 784 | 83.9 |
| | Single | 150 | 16.1 |
| Income | UMR | 484 | 51.8 |
| | > UMR | 450 | 48.2 |
| Length of work | < 10 Years | 283 | 30.3 |
| | > 10 Years | 651 | 69.7 |

## Characteristics of the Research Respondents

The study surveyed 934 respondents to understand their demographic characteristics. Most respondents were women (56.4%), aged between 25 and 31 years (48.3%). Most identified as Muslim (61.9%) and held a diploma (52.9%). Occupation-wise, nurses were the largest group (40.3%), followed by pharmacists (22.4%) and doctors (19.1%). A significant majority of respondents were married (83.9%), with a fairly even split between those earning the regional minimum wage (51.8%) and those earning above it (48.2%). Most respondents had over 10 years of work experience (69.7%).

## Model Testing

### *Outer Model Evaluation*

The evaluation of the measurement model is the stage used to evaluate the validity and reliability of a construct, which consists of Construct Validity Evaluation and Construct Reliability Evaluation (Figure 1).

### *Test Convergent Validity*

The results of the convergent validity tests, presented in Table 2, show that most indicators meet the threshold for loading factors and Average Variance Extracted (AVE) values, confirming the validity of the constructs.

### *Construct Reliability*

The calculations that can be used to test construct reliability are Cronbach's alpha and composite reliability. The test criteria state that if the composite reliability is greater than 0.7 and Cronbach's alpha is greater than 0.6, then the construct is declared to be reliable. The results of

Table 2. Convergent Validity Test Results

| Variable | Indicator | | *Loading Factor* | AVE |
|---|---|---|---|---|
| (X1) Individual Characteristics | Knowledge | X1.1 | 0.771 | |
| | Ability | X1.2 | 0.590 | |
| | Skills | X1.3 | 0.783 | 0.562 |
| | Attitude | X1.4 | 0.827 | |
| | Motivation | X1.5 | 0.750 | |
| | Personality | X1.7 | 0.757 | |
| (X2) Team Characteristics | Team Structure | X2.1 | 0.742 | |
| | Leadership Ability | X2.3 | 0.873 | |
| | Personal Attractions | X2.4 | 0.923 | 0.730 |
| | Sense of Togetherness | X2.5 | 0.907 | |
| | Respect Group | X2.6 | 0.815 | |
| (X3) Task Characteristics | Skills | X3.1 | 1,000 | |
| | Identity | X3.2 | 1,000 | 0.999 |
| | Autonomy | X3.3 | 0.989 | |
| (X4) Work Structure | Job Assignments | X4.1 | 0.812 | |
| | Communication Structure | X4.2 | 0.740 | 0.525 |
| | Team Norms | X4.3 | 0.532 | |
| (X5) Community Leader | Public Figure | X5.1 | 0.768 | |
| | Religious Leaders | X5.2 | 0.821 | 0.618 |
| | Volunteer | X5.3 | 0.768 | |
| | Cadre | X5.4 | 0.876 | |
| (X6) Cross-sectors | Health Professional Organization | X6.1 | 0.881 | |
| | Ward | X6.2 | 0.752 | |
| | Districts | X6.1 | 0.781 | 0.640 |
| | Public Health Center | X6.2 | 0.852 | |
| | Social Services | X6.3 | 0.859 | |
| | Public health Office | X6.4 | 0.697 | |
| (Y1) Interprofessional collaborative based on community sectoral coordination | Values and Ethics | Y1.1 | 0.555 | |
| | Roles and Responsibilities | Y1.2 | 0.802 | |
| | Communication | Y1.3 | 0.782 | 0.535 |
| | Teamwork | Y1.4 | 0.805 | |
| | Leadership | Y1.5 | 0.680 | |
| (Y2) *Herd Immunity* | Vigilance | Y2.1 | 0.912 | |
| | Obedience | Y2.2 | 0.882 | 0.876 |
| | Resilience | Y2.3 | 0.895 | |

Table 3. Construct Reliability Test Results

| Variable | *Cronbach's Alpha* | *Composite Reliability* |
|---|---|---|
| Individual Characteristics | 0.844 | 0.884 |
| Team Character | 0.906 | 0.931 |
| Task Characteristics | 0.999 | 1,000 |
| Job Structure | 0.696 | 0.812 |
| Public Figure | 0.691 | 0.829 |
| Cross-sector | 0.812 | 0.876 |
| *Interprofessional collaborative* based on community sector coordination | 0.776 | 0.849 |
| *Herd Immunity* | 0.826 | 0.776 |

the calculation of composite reliability and Cronbach's alpha can be seen in the summary presented in Table 3.

Based on Table 3, it can be seen that each variable produces a Cronbach's alpha value greater than 0.6 or a composite reliability value greater than 0.7. Thus, based on the calculation of the Cronbach's alpha value or the composite reliability value, all indicators are declared to be reliable for measuring the variables.

## Inner Model Evaluation

### *Coefficient of Determination ($R^2$)*

Table 4. shows that the R-square value of the Integrated Discharge Planning variable is 0.772or 77.2%. This shows that the diversity of the variable *Interprofessional collaborative* based on community sector coordination can be explained by Individual Characteristics, Team Characteristics, Task Characteristics, Job Structures, Community Leaders, and Cross Sectors, amounting to 77.2%. In other words, the contribution of the influence of Individual Characteristics, Team Characteristics, Task Characteristics, Job Structures, Community Leaders, and Cross Sectors to *Interprofessional collaborative* based on community sector coordination is 77.2%. The remaining 21.8% is the contribution of other variables not discussed in this study.

### *Predictive Relevance (Q2)*

The value of Q2 can be used to measure how well the observed values are generated by the model and the estimated parameters. A Q2 value greater than 0 (zero) indicates that the model is said to be good enough, while a Q2 value less than 0 (zero) indicates that the model lacks predictive relevance. Table 5 shows the results of the Predictive Relevance (Q2) test.

Table 4. Results of the Coefficient of Determination (R2)

| Dependent Variable | R Square | R Square Adjusted |
|---|---|---|
| *Interprofessional collaborative* based on community sector coordination | 0.498 | 0.483 |
| *Herd Immunity* | 0.274 | 0.213 |

The results in Table 5 show that all variables produce a Predictive Relevance (Q2) value greater than 0 (zero), which indicates that the model is said to be good enough.

## Hypothesis testing

Significance testing is used to test whether there is an effect due to the exogenous variables on the endogenous variables. The test criteria states that if the value of the T-statistics in the T-table (1.96) or P-value < significant alpha 5% or 0.05, it means that there is a significant effect due to the exogenous variables on the endogenous variables. The results of the significance and model testing can be seen in Figure 2.

Table 6 shows that all seven hypotheses are fulfilled, indicating that individual, team, and task characteristics, work structure, community role, and cross-sector collaboration significantly and positively influence interprofessional collaborative efforts based on community sector coordination.

## Discussions

Individual characteristics, such as abilities, skills, knowledge, attitudes, motivation, beliefs, and personality, significantly impact IPC efforts (Armitage *et al.*, 2017). The study found that a notable percentage of respondents lacked adequate knowledge (46.8%), skills (52.4%), and confidence (53.9%). These findings align with previous studies highlighting knowledge and preparedness gaps among healthcare workers during the pandemic (Cao *et al.*, 2020; Liu *et al.*, 2020). Effective IPC requires strong individual competencies, communication skills, and teamwork abilities, which are crucial for collaboration, especially during a pandemic (Ma *et al.*, 2020). The importance of individual learning and development in fostering IPC has also been highlighted in recent research (Reeves *et al.*, 2013; Verbeek *et al.*, 2023).

Team characteristics, including structure, power distribution, leadership, personal attraction, sense of togetherness, and group respect, are essential for effective IPC. Strong team dynamics, effective leadership, and mutual respect enhance collaboration and team performance. These findings echo the research

Table 5. Predictive Relevance Test Results (Q2)

| Variable | SSO | SSE | $Q^2$ (=1-SSE/SSO) |
|---|---|---|---|
| Individual Characteristics | 1,242,000 | 768,255 | 0.381 |
| Team Character | 1.035,000 | 448,239 | 0.567 |
| Task Characteristics | 414,000 | 121,329 | 0.707 |
| Job Structure | 828,000 | 625,903 | 0.244 |
| Public Figure | 621,000 | 462,921 | 0.255 |
| Cross-sector | 828,000 | 504.788 | 0.390 |
| *Interprofessional collaboration* based on community sector coordination | 1.035,000 | 709,465 | 0.315 |
| *Herd Immunity* | 876,000 | 519,721 | 0.387 |

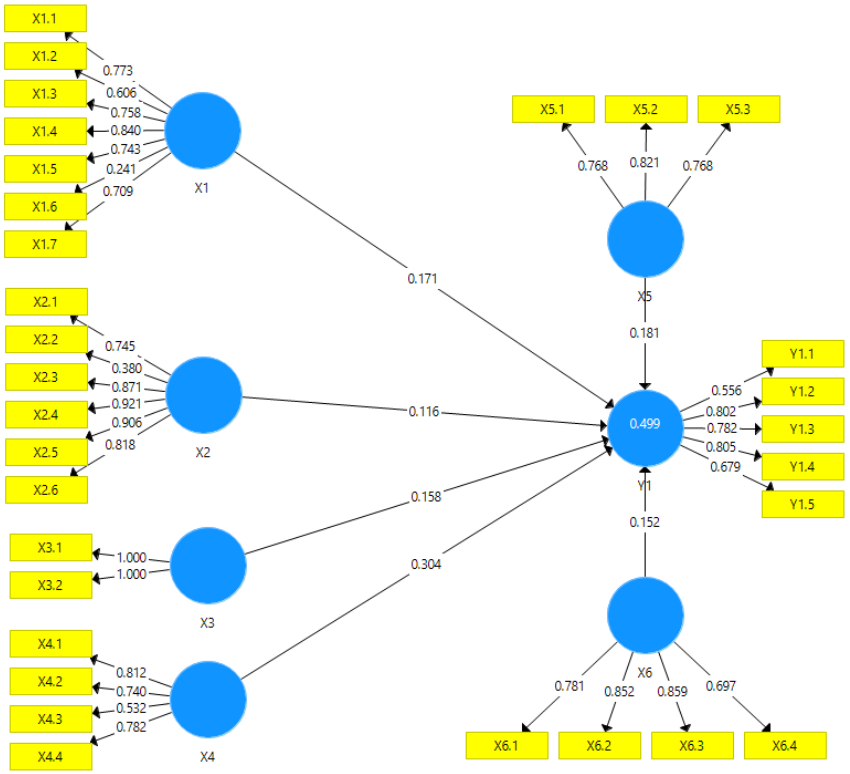


Figure 1. Outer Model Construct

emphasizing the importance of cohesive teams and effective leadership in healthcare settings (Barzilay *et al.*, 2020; Di *et al.*, 2020) Cohesiveness and a sense of togetherness foster a positive team environment, which is essential for achieving team goals and integrating with external sectors, particularly during challenging times like the COVID-19 pandemic (Ma *et al.*, 2020).

Job characteristics, such as organizational tasks, task types, and task complexity, significantly influence IPC. Clear task definitions, effective delegation, and strong leadership are crucial for successful collaboration. Our findings align with the research on the importance of clear roles and responsibilities in healthcare teams (Lai *et al.*, 2020). Leadership abilities help navigate task complexity, inspire team members, and achieve organizational objectives, driving positive outcomes in multidisciplinary teams, especially in high-pressure situations like a pandemic response.

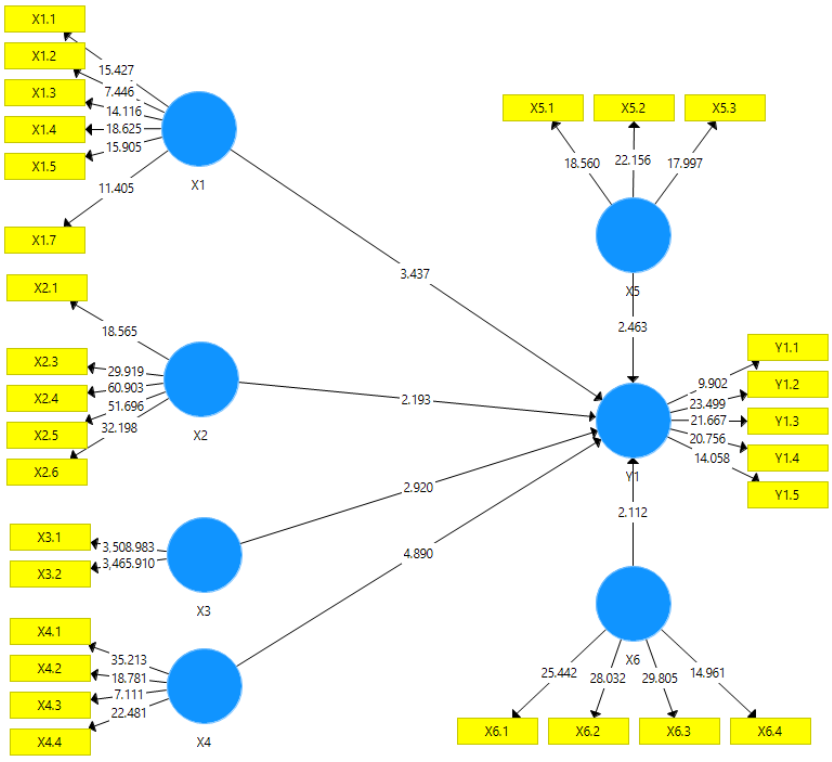


Figure 2. Inner Model Construct

Work structure, including job tasks, task types, and communication structure, significantly impacts IPC. Effective teamwork, task delegation, and cooperation within a team are vital for achieving common goals and managing workloads. Efficient work structures enhance collaboration, ensuring timely task completion and high-quality results, supporting overall team objectives. This is consistent with the findings that emphasize the need for structured communication and coordination in healthcare teams to ensure efficient and effective care delivery (Lai *et al.*, 2020).

Community leaders significantly impact interprofessional collaboration as their integration can predict positive outcomes in collaborative efforts. Community Health Efforts (UKM) involve the government, community, and private sector activities to improve health and address health issues, including health promotion, infectious disease eradication, and environmental health. Community leaders, recognized for their social positions and expertise, guide and influence their communities. Religious figures and health volunteers also play vital roles in providing knowledge and support. During COVID-19, community leaders enhanced coordination with Professional Provider Alliance (PPA) teams in hospitals, gaining trust and facilitating effective education and health initiatives. This aligns with the emphasis on community engagement in health initiatives found in research such as the studies by Cheng *et al.* (2020) and as advocated for by the (World Health Organization (WHO), 2010).

Cross-sector collaboration is crucial for effective interprofessional collaboration, particularly in managing COVID-19. This involves roles from professional health organizations, village officials, and various health services working together to ensure there is a coordinated effort. Professional organizations help by providing resources, incentives, and support for health workers. The continuous integration and periodic monitoring of cross-sectoral efforts are essential for successful COVID-19 mitigation. Effective communication, sanitation protocols, educational guidelines, and regional financing are part of these cross-sectoral roles, enhancing the efficiency and effectiveness of COVID-19 handling programs. This echoes findings on the importance of coordinated efforts and inter-sectoral collaboration for an effective pandemic response (Stoecklin *et al.*, 2020).

Interprofessional collaboration is vital in managing the COVID-19 pandemic and achieving herd immunity. The rapid spread of COVID-19 has overwhelmed healthcare systems, disrupted education, and caused economic downturns (Fernandes, 2020). Maintaining health protocols and public vigilance are essential in pandemic resilience. Health workers, who are facing high workloads, need to work collaboratively to provide quality care. Despite the importance of teamwork, interprofessional collaboration is often poorly defined, leading to fragmented care. Improving collaboration among health workers aims to create resilient teams capable of managing COVID-19 and supporting the community adaptation to the pandemic. The importance of collaborative practice in the 21st century, particularly in crisis situations like the COVID-19 pandemic, has been increasingly recognized in the healthcare literature (Gilbert, Yan and Hoffman, 2010; Jordan, Connors and Mastalerz, 2022). Community and cross-sector participation are key to comprehensive COVID-19 management and resilience. This highlights the need for a comprehensive approach to pandemic management, involving collaboration at all levels, from individual healthcare workers to community leaders and across different sectors of society (Stoecklin *et al.*, 2020).

The study's focus on interprofessional collaboration is particularly relevant given the importance of teamwork in responding to pandemics like COVID-19. By analyzing how collaboration between healthcare workers and other sectors impacts public health outcomes, the study addresses a timely and critical issue, with findings that could inform future public health strategies and policies. The study is confined to regions within Java, Indonesia, which limits its geographical scope. While this focus provides depth, it also limits the external validity of the findings. Public health systems and community structures vary widely across different regions and countries, so the model may not be easily applicable in other global contexts.

## Conclusion

This study demonstrates the significant impact of individual, team, job, and community factors on interprofessional collaboration (IPC) in the context of COVID-19 and future pandemics. Our findings highlight the critical need to address knowledge gaps, enhance team dynamics, strengthen leadership, and integrate community and cross-sector collaboration to create a more resilient healthcare system and promote an effective pandemic response. Also, the results of this research underscore the importance of a comprehensive approach to pandemic preparedness and responses. By addressing the specific factors identified in this study, from individual competencies to cross-sector coordination, it can empower healthcare professionals, engage community leaders, and build resilient systems capable of mitigating the impact of current and future health crises.

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## Availability of data and materials

The dataset generated during this study is not publicly available due to the nature of the e-supervisor and personal information contained in the data. Data can be made available from the current author, with their supervisor and after ethical approval.

## Authors' contributions

The first, second, third author is responsible for designing the study, analyzing and interpreting the data, including involvement in the preparation of the manuscript. The fourth author assisted in discussions on data interpretation, contributed background knowledge, and was involved in drafting the manuscript. The first author provided advice on analysis methods, data interpretation, and drafting the manuscript. All authors read and approved the final manuscript.

## Declaration of Interest

The author declares that in the research activities and preparation of research manuscripts for scientific publications there is no conflict of interest with any party, so that the articles written can be published in full by all authors involved in the research manuscript.

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