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Determinants of Interprofessional Collaboration Among Nurses: The Role of Demographics, Work Experience, and Workplace Culture

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INTRODUCTION

Hospital-based healthcare delivery involves a multidisciplinary approach that often risks service overlap, interprofessional conflicts, delays in diagnosis and treatment, and even medication errors(1). Studies show that 70-80% of healthcare errors stem from poor team communication and a lack of mutual understanding, while effective teamwork

significantly improves patient safety. According to the Joint Commission on Accreditation of Healthcare Organizations, in the United States, medical errors was the fifth most common cause of death, largely due to poor interprofessional collaboration (2).

In Indonesia, the incidence of medical errors ranges from 4.1% to 91.6%, with 11% due to administration mistakes, 54% to prescribing

errors, and 46% to inappropriate medication use. These safety issues are exacerbated by suboptimal interprofessional collaboration, particularly hierarchical decision-making patterns, where physicians account for approximately 86% of clinical decisions with limited involvement from nurses and other health professionals. (3). Evidence suggests that protocol adherence alone is inadequate; sustained patient safety improvements require effective communication, coordination, and collaborative practice across professions (4).

Interventions targeting communication and teamwork have demonstrated measurable benefits. A study by Dietl et al. on 137 healthcare workers found that a 4-hour communication training significantly reduced perceived patient safety risks ($p = .007$). While no direct changes in team communication or performance perception were observed, interpersonal communication mediated the link between psychological safety and both safety outcomes and perceived team performance (5). These findings underscore the importance of relational and cultural factors, beyond individual competencies, in shaping IPC effectiveness.

General Hospitals in Banten Province, Indonesia, manage patients with diverse and complex health needs. In such settings, IPC has been shown to reduce complications, length of hospital stay, team conflict, and mortality, while also improving staff satisfaction and care continuity. IPC is also beneficial in mental health settings, improving patient and staff satisfaction and reducing suicide rates and outpatient visits (6,7).

Institutional data from Medical Services Division in a General Hospital in Banten revealed community satisfaction indices ranging from 86.82% to 88.79% in the third trimester of 2024. Despite these favorable service indicators, IPC implementation remains variable and may be influenced by individual and organizational determinants. Demographic characteristics such as gender, age, education level, and work experience can shape communication styles, professional confidence, and collaborative behavior among healthcare workers.

Work culture also plays a vital role in IPC implementation. A strong organizational culture supports quality care, patient safety, and team performance (8) by shaping shared values, professional attitudes, and patterns of responsibility (6). An internal survey in a General

Hospital in Banten showed that the work environment supports specialist doctor performance, with 84.4% satisfied with salary alignment, 84.4% motivated by new challenges, and 87.5% demonstrating punctuality. Performance indicators show 87.5% avoid absenteeism, 65.6% engage with patients, and 81.2% attend management meetings, aligning with hospital policy targets (9).

Despite growing global evidence on IPC, there remains a limited understanding of how demographic factors and workplace culture jointly influence IPC implementation among nurses in Indonesian hospital settings. Most existing studies focus on single professional groups or intervention outcomes, with less attention to contextual organizational factors in routine clinical practice. Therefore, this study aims to address this gap by examining the relationship between nurses' demographic characteristics, work experience, workplace culture, and IPC implementation in a general hospital in Banten Province, Indonesia, contributing context-specific evidence to support organizational strategies for strengthening collaborative care.

METHODS

Study Design

A quantitative cross-sectional study design was employed to examine associations between demographic characteristics (gender, age, education level, and work experience), workplace culture, and the implementation of interprofessional collaboration (IPC) among nurses at a general hospital in Banten Province, Indonesia. Data collection was conducted in November 2024. This design was selected to efficiently assess individual and organizational factors influencing IPC within a real-world clinical setting.

Sample

The study population consisted of 219 nurses working in inpatient and intensive care units who were directly involved in patient care. Sample size was calculated using Slovin's formula with a 5% margin of error, resulting in a minimum required sample of 73 participants. To account for potential non-response, the sample size was increased by 10%, yielding a final sample of 80 nurses.

Participants were recruited using stratified random sampling from nine inpatient wards, one Intensive Care Unit (ICU), one Intensive Cardiac Care Unit (ICCU), and one Pediatric Intensive Care Unit (PICU). Proportional allocation was applied: 58 nurses from inpatient wards (population = 161), 15 from ICU (population = 41), 4 from ICCU (population = 10), and 8 from PICU (population = 21).

Inclusion criteria were nurses who were active staff members in inpatient or intensive care units, had a minimum of one year of work experience, and provided written informed consent. Exclusion criteria included nurses on long-term leave (e.g., maternity or prolonged illness) and those not directly involved in patient care, such as nurses in managerial or administrative positions.

Instruments

Data were collected using a self-administered, structured questionnaire consisting of three sections: demographic characteristics, workplace culture, and interprofessional collaboration (IPC) implementation.

The demographic section captured participants' gender, age, highest education level, and years of work experience. The workplace culture instrument was developed by the research team based on organizational behavior and healthcare teamwork literature. It comprised 22 items across four dimensions: discipline, openness, mutual respect, and teamwork. The IPC implementation instrument consisted of 25 items representing six domains: effective interprofessional communication, teamwork, shared decision-making, respect for professional roles and responsibilities, organizational and policy support, and enhancement of patient safety and quality of care. All items were rated using a two-point Likert-type scale (1 = poor, 2 = good). Content validity of both instruments was evaluated by a panel of three experts in nursing management, hospital administration, and patient safety. Each item was assessed for relevance, clarity, and representativeness using a four-point rating scale. The Content Validity Index (CVI) for the workplace culture instrument was 0.89, and for the IPC implementation instrument was 0.91, indicating excellent content validity. Reliability testing was conducted in a pilot study involving 30 nurses who were not included in the main sample. Internal consistency was assessed using Cronbach's alpha. The workplace culture instrument demonstrated

good reliability ($\alpha = 0.953$), while the IPC implementation instrument showed excellent reliability ($\alpha = 0.958$), exceeding the recommended threshold of 0.70.

Data Collection

Data were collected using self-administered questionnaires distributed to eligible participants during working hours. The data collection process was supervised by the research team to ensure standardized procedures, clarify instructions, and address participants' questions without influencing their responses. Participants completed the questionnaires anonymously to encourage honest and unbiased reporting.

Data Analysis

Data were analyzed using SPSS version 27.0. Univariate analysis was performed to describe respondent characteristics and variable distributions. Bivariate analysis using the Chi-square test assessed associations between independent variables and IPC implementation. Variables with p -values < 0.25 in bivariate analysis were entered into the multivariate model.

Binary logistic regression analysis was conducted to identify factors independently associated with IPC implementation. Key assumptions—including independence of observations, absence of multicollinearity among predictors, and adequate sample size relative to the number of variables—were evaluated prior to model fitting. Results were reported as odds ratios (ORs) with 95% confidence intervals, and statistical significance was set at $p < 0.05$.

Ethical Considerations

The study was approved by the University Ethics Committee (approval number: 1777/XII/F.9-UMJ/2024) and authorized by the Banten Provincial Government Health Service (approval number: B-000.9/4955/PSUB/2024). Written informed consent was obtained from all participants, and confidentiality and anonymity were strictly maintained throughout the study.

RESULTS

A total of 80 nurses participated in the study. Based on gender distribution, 27 respondents (33.8%) were male and 53 respondents (66.2%) were female. Regarding age, 41 respondents (51.2%) were aged ≤ 35 years, while 39 respondents (48.8%) were > 35 years. In terms of

educational background, 41 respondents (51.2%) had professional degrees and 39 respondents (48.8%) had vocational education. With respect to work experience, 31 respondents (38.8%) had ≤ 5 years of experience and 49 respondents (61.3%) had >5 years of experience. Half of the respondents demonstrated poor work culture ($n = 40$; 50.0%), while the remaining half demonstrated good work culture ($n = 40$; 50.0%). Regarding IPC implementation, 34 respondents (42.5%) were categorized as having poor IPC implementation and 46 respondents (57.5%) demonstrated good IPC implementation (Table 1).

In the bivariate analysis, a higher proportion of female nurses demonstrated good IPC implementation (58.5%) compared to male nurses (51.9%); however, this difference was not statistically significant (χ^2 test, $p = 0.624$). Nurses aged ≤ 35 years showed a slightly higher proportion of good IPC implementation (58.5%) compared to those aged >35 years (56.4%). Although this association reached statistical significance ($p = 0.048$), the corresponding odds ratio was close to unity ($OR = 0.917$), indicating a weak association.

In terms of education background, nurses with vocational education demonstrated a marginally higher proportion of good IPC implementation (59.0%) compared to those with professional degrees (56.1%). This association was statistically significant ($p = 0.047$); however, the

effect size was small ($OR = 0.899$), suggesting limited practical significance.

Work experience was significantly associated with IPC implementation. Nurses with more than five years of experience demonstrated a higher proportion of good IPC implementation (59.2%) compared to those with five years or less (54.8%) ($p < 0.001$). Nevertheless, the odds ratio indicated a modest association ($OR = 1.194$).

A strong association was observed between work culture and IPC implementation. Nurses reporting a good work culture demonstrated a substantially higher proportion of good IPC implementation (80.0%) compared to those reporting poor work culture (35.0%). This association was statistically significant with a large effect size ($p < 0.001$; $OR = 7.429$), indicating a robust relationship between work culture and IPC implementation.

Variables with p -values < 0.25 in the bivariate analysis, along with theoretically relevant variables, were included in the multivariate logistic regression model. After adjustment, gender, age, education level, and work experience were not independently associated with IPC implementation ($p > 0.05$) and were excluded from the final model.

In the final multivariate model, work culture remained the only variable independently associated with IPC implementation, with a p -value < 0.001 and an odds ratio of 7.429 (95% CI: 2.703–20.419) (Table 3).

Table 1. Respondents' demography, work culture and IPC implementation

Variable		Total (n=80)	(%)
Gender	Male	27	33.8
	Female	53	66.2
Age	≤ 35 years	41	51.2
	>35 years	39	48.8
Education	Diploma	41	51.2
	Vocation	39	48.8
Work Experience	≤ 5 years	31	38.8
	>5 years	49	61.3
Work Culture	Poor	40	50
	Good	40	50
IPC Implementation	Poor	34	42.5
	Good	46	57.5

Table 2. Analysis on demographic factors, work experience and work culture towards IPC implementation

		IPC				OR	P Value		
		Poor		Good					
		n	%	n	%				
Gender	Male	13	48.1	14	51.9	1.42 (0.56-3.60)	0.624		
	Female	21	39.6	32	60.4				
Age	≤35 years	17	41.5	24	58.5	0.92 (0.38-2.23)	0.048		
	>35 years	17	43.6	22	56.4				
Education	Diploma	16	40.0	23	59.0	0.89 (0.34-2.16)	0.047		
	Vocation	18	43.9	23	56.1				
Work Experience	≤5 years	14	45.2	17	54.8	1.19 (0.48-2.96)	0.000		
	>5 years	20	40.8	29	59.2				
Work Culture	Poor	26	65.0	14	35.0	7.43 (2.70-20.42)	0.001		
	Good	8	20.0	32	80.0				

Table 3. Final logistic regression model

Variable	B	SE	Wald	P value	OR	95% CI for EXP (B)	
						Lower	
						Upper	
Work Culture	2,005	0,516	15,110	0,000	7,429	2,703	20,419
Constant	-2,624	0,772	11,560	0,001	0,072		

DISCUSSION

This study examined the influence of demographic characteristics, work experience, and workplace culture on nurses' implementation of interprofessional collaboration (IPC) in a general hospital in Banten Province, Indonesia. While several demographic variables demonstrated statistically significant associations with IPC at the bivariate level, multivariate analysis identified workplace culture as the sole independent determinant, highlighting the dominant role of organizational context over individual characteristics in shaping collaborative practice.

The predominance of female nurses in this study reflects the broader gender distribution within the nursing profession. Although gender-related differences in communication styles and professional behavior have been described in the literature, gender was not independently associated with IPC implementation in the present study. In a study of 580 nurses in Dar es

Salaam across 4 hospitals, 63 out of 70 items showed better professional practices among female nurses. Male nurses were 0.528 times less likely to exhibit strong professional development (10). It is possible that female dominance in nursing positively affects IPC implementation through empathetic communication and problem-solving with patients and families (11). However, other research has found no differences between genders in work performance, problem-solving ability, motivation, or competitiveness (12). A multicenter study in Japan found that collaborative leadership and supportive workplace social capital were strongly associated with IPC practices and a positive patient safety climate, suggesting that organizational dynamics mediate interpersonal collaboration more than individual demographics alone (13). This suggests that IPC performance is more strongly influenced by organizational norms and team structures than by individual gender characteristics.

A significant association was found between age and IPC implementation ($p = 0.048$), with an OR of 0.917 indicating that nurses over 35 years old have a slightly lower likelihood of good IPC performance compared to those under 35. However, the odds ratio was close to 1, indicating a weak practical effect. Younger nurses showed slightly better IPC performance, which may reflect greater exposure to contemporary educational approaches emphasizing teamwork and interprofessional communication. Nevertheless, this association did not persist after adjustment, suggesting that age alone is insufficient to explain collaborative behavior in clinical settings. Age may workplace behavior and attitudes. At the hospital in Banten Province, more senior healthcare workers showed a better understanding of the importance of cross-professional coordination, while another study did not find any significant difference (14). A recent scoping review on IPC in surgery highlighted that determinants of IPC exist at multiple levels; individual, team, and organizational characteristics often act as conduits through which other factors exert their effects (15). This supports our finding that once workplace culture is accounted for, the direct effects of age, education, and experience diminish.

Similarly, education level showed a statistically significant but weak association with IPC implementation. Nurses with vocational education demonstrated marginally better IPC performance than those with professional degrees. A study in Saudi Arabia also found that education levels correlate with teamwork attitude, with p value of 0.041 (14). A 2023 review found that interprofessional education in nursing promotes patient safety, enhances collaboration skills, and supports the development of professional identity among undergraduate nursing students (16). However, this finding should be interpreted cautiously, as higher educational attainment is generally associated with enhanced critical thinking and collaborative competencies. One possible explanation is that vocationally trained nurses may have longer or more continuous exposure to bedside teamwork, while professionally trained nurses may assume more independent or leadership-oriented roles that limit routine interprofessional interaction. These nuances highlight the importance of contextual and role-based factors rather than formal education level alone.

Evidence from recent studies supports the value of interprofessional education (IPE) in improving collaboration skills, professional identity, and patient safety outcomes, underscoring the need for structured IPC-focused curricula across all educational levels. A national interprofessional education academy in Turkey demonstrated that even a short, structured four-day IPE intervention significantly improved interprofessional identity, teamwork attitudes, role clarity, patient-centeredness, and cultural competence among healthcare students, highlighting the effectiveness of intensive, practice-oriented IPE programs in fostering collaborative competencies. The study also revealed increased awareness of the importance of IPE and a constructive shift in participants' perceptions of their professional roles within team-based training environments, reinforcing the role of IPE in shaping professional identity and readiness for collaborative practice (17). According to Green & Johnson, interprofessional training not only enhances learners' ability to work together effectively across disciplines but also fosters mutual respect, shared understanding of roles, and a collaborative mindset that translates into clinical practice and improved patient outcomes. Moreover, collaborative practice models informed by IPE are associated with reduced medical errors and better coordination of care, as they help bridge gaps between individual profession-specific training and the realities of team-based clinical environments (18).

Work experience showed a strong significant relationship with IPC implementation ($p = 0.000$). Longer work experience enhances understanding of team dynamics and the importance of coordination. Similarly, another study found that teamwork attitude among CCU nurses showed a positive mean score of 66.09 ($SD = 15.12$), significantly influenced by work experience ($\beta = 0.24$, $p < 0.05$). (14) Most nurses at the hospital had over five years of experience, making them valuable sources of knowledge and expertise in applying service policies effectively. A systematic review by Ho et al. analyzed 21 studies to explore healthcare professionals' experiences with IPC for patient education. The analysis identified five main themes: clear definition of roles, systems supporting communication, common areas for collaboration, mutual trust among professionals, and backing from the organization (19). These can be

achieved by a longer work experience in the same field and settings, as seen in our study.

Among all variables examined, workplace culture emerged as the strongest and only independent predictor of IPC implementation, with a substantial effect size. A positive work culture, characterized by openness, mutual respect, discipline, and teamwork, creates psychological safety and reduces hierarchical barriers, enabling effective interprofessional communication and shared decision-making. A culture valuing openness, mutual respect, and teamwork improves IPC effectiveness. This culture is reflected in discipline (adherence to procedures), openness (transparent communication across professions), and teamwork (strengthened by training programs and activities such as morning reports) (20). Research on 184 healthcare professionals in intrapartum care settings reported that patient safety culture and teamwork perceptions were closely intertwined, with teamwork correlating with better overall safety performance (21). According to Schmidt et al in their interprofessional team training study report that elements of safety culture and communication are foundational to successful IPC implementation across diverse clinical contexts (22). However, challenges like rigid hierarchies and professional dominance must be addressed to further enhance IPC (20).

A study on 881 clinical nurses in teaching hospital in Oman reported work environment enhancements that prioritize reciprocity and cross-professional trust have been linked to improvements in IPC and patient outcomes, including job satisfaction and reduced adverse events (23). Another recent review of IPC interventions found that practice-based IPC strategies such as structured joint activities and shared care planning may improve aspects of professional practice and clinical processes, suggesting that organizational support for collaborative structures can positively influence both teamwork behaviours and care delivery outcomes (24). According to a systematic review of implementation determinants across country income levels, organizational and relational factors such as structural support, teamwork facilitation, and multidisciplinary networks emerged as key facilitators in embedding IPC into routine clinical work. This underscores the importance of contextually tailored organizational interventions for successful

collaboration and implementation of practice changes (25).

Overall, this study's findings suggest that improving IPC in hospital settings requires organizational-level interventions rather than reliance on individual attributes, which is in line with recently published high impact studies. This supports the interpretation that interventions targeting work culture, leadership, and structured interprofessional processes are likely to yield more meaningful improvements in collaborative practice than demographic-focused strategies alone. Strengthening workplace culture may provide a sustainable pathway to enhancing collaboration and patient care quality in Indonesian hospitals.

Study Limitations

This study has several limitations that should be considered when interpreting the findings. The cross-sectional design limits the ability to determine causal relationships between demographic factors, workplace culture, and IPC implementation. Data were collected from a single hospital, which may limit generalizability to other healthcare settings with different organizational structures or cultural norms. The use of a researcher-developed questionnaire and a two-point Likert scale, while practical for a busy clinical environment, may have reduced sensitivity in capturing nuanced perceptions of IPC and workplace culture. Additionally, self-reported data are subjective and has a high risk of response bias. Future studies employing longitudinal designs, validated multidimensional instruments, and mixed-methods approaches are warranted to better capture the complexity of IPC dynamics.

CONCLUSION

This study demonstrates a significant association between workplace culture and nurses' implementation of interprofessional collaboration, highlighting the central role of organizational context in supporting effective IPC practices. These findings contribute to the growing body of IPC literature by providing empirical evidence from an Indonesian hospital setting, where contextual and cultural influences remain underexplored. Strengthening a collaborative work culture may enhance communication, shared decision-making, and patient safety outcomes in hospital care. The General Hospital in Banten Province should

initiate programs to improve work culture, such as leadership and soft skills training, service excellence workshops, patient safety seminars, and weekly clinical reporting. The hospital should also introduce awards to recognize exemplary medical staff. Furthermore, future research should employ longitudinal or intervention-based designs and more sensitive measurement tools to better elucidate causal pathways and evaluate strategies aimed at improving IPC among healthcare professionals.

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Author Contributions

Conceptualization: S., H.F., E.W.

Methodology: S., H.F., E.W.

Data collection: S.

Formal analysis: S., H.F.

Writing; original draft preparation: S.

Writing; review and editing: H.F., E.W.

All authors have read and approved the final manuscript.

Conflict of Interest Disclosure

The authors do not have any financial, personal, or professional relationships that could be perceived as influencing the work.

Data Availability Statement

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request, subject to institutional and ethical regulations.

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