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OVERVIEW OF THE COMPETENCE OF UDAYANA UNIVERSITY MEDICAL STUDENTS IN IMPLEMENTING INTERPROFESSIONAL COLLABORATION (IPC)

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ABSTRACT

Background and Objective: Interprofessional Collaboration (IPC) plays an important role in improving the quality of healthcare services through professional teamwork. To prepare students for IPC effectively, Interprofessional Education (IPE) has been introduced. This study aimed to evaluate the competency of medical students at Udayana University in implementing IPC after participating in the IPE program.

Methods: A descriptive observational study with a cross sectional approach was conducted among 83 undergraduate medical students from the 2022 cohort of Udayana University who had completed the IPE. Data were collected using the Interprofessional Collaborative Competencies Attainment Survey (ICCAS) questionnaire and analyzed descriptively. Kolmogorov Smirnov normality test performed using SPSS.

Results: All IPC competency variables (communication, collaboration, roles and responsibilities, patient/family centered approach, conflict management, and team functioning) were not normally distributed ($p < 0.05$); therefore, classification was based on the median values. The findings showed that most students demonstrated low competency levels across all IPC domains.

Conclusion: Although the IPE program had a positive impact on some students, the overall competency levels remained suboptimal. Continuous implementation of IPE with more innovative learning methods is needed to better prepare students for professional collaboration. Future studies should compare competencies before and after IPE to obtain more comprehensive results.

Keywords: Interprofessional Collaboration, Interprofessional Education, Medical Students.

INTRODUCTION

The quality of health services is a very important aspect to achieve patient satisfaction and maximum health degrees. Nowadays, health problems have become so complex. This is shown by delays in services, treatments that are less safe, less effective and cost-effective, and the emergence of new diseases so that it is difficult for medical personnel to provide maximum care. Therefore, Interprofessional Collaboration (IPC) is needed to deal with problems in the field of health services.[1,2,3] According to the Canadian Interprofessional Health Collaborative (CIHC) in 2010, collaboration in the world of health is created when there are several health workers with colleagues from other professions, patients and families working together to achieve good health.[4,5]

Interprofessional Collaboration (IPC) has proven to be one of the important aspects in carrying out the profession in the health sector, but its implementation is still not optimal. Some medical errors are caused by medical personnel who are less collaborative. An example of a case that occurs is the high maternal and neonatal mortality rate, which is caused by a lack of collaboration between the midwife and the doctor concerned[6]. Not only by professionals, the lack of collaborative practices is also experienced by students in the health

sector. Lack of communication and differences in terms of viewpoints, opinions, ways of thinking, and culture are challenges that must be faced by students across study programs to be able to collaborate well with each other. A research stated that out of 190 respondents, as many as 42.6% of students have interprofessional collaboration skills in the medium category, and 57.4% have interprofessional collaboration skills in the good category. These results can provide an idea that the collaborationism of interprofessional students is still not optimal.[7]

In order to improve the ability to collaborate between health workers, an organized learning system is needed to improve communication skills, cooperation, decision making, and conflict management between study programs to create good collaboration. One of the programs applied in the world of health education today is the interprofessional education (IPE) program.[8,21] In recent decades, IPE has also received worldwide attention, because it is able to improve the collaboration ability of medical personnel so that it can improve the quality of health services.[9,23] In some countries such as Canada, the United Kingdom, Sweden and Denmark, this program has been implemented for more than 20 years.[10] IPE itself has been implemented since the preclinical period with the aim of preparing students before entering the professional world. At Udayana University, the IPE program has been implemented since 2015.[22] Through IPE, students are able to improve collaboration skills.[11] For example, as many as 85% of the total 171 students experienced an increase in collaboration skills after running. This program is expected to be able to prepare students to run IPC at the professional stage in the future.[12] In addition to addressing patient safety and quality of care, IPC is increasingly recognized as a core competency in health professional education frameworks worldwide. Global accreditation bodies emphasize that effective collaboration skills should be cultivated early in undergraduate education to prepare students for complex clinical environments that demand teamwork across professional boundaries. Without adequate exposure and assessment during the preclinical phase, students may enter clinical practice with limited readiness to function effectively in interprofessional teams. Therefore, evaluating IPC competencies among undergraduate medical students is essential not only to assess educational outcomes but also to inform curriculum development and policy decisions related to IPE implementation.[2,3] This study aimed to evaluate the competency of medical students at Udayana University in implementing IPC after participating in the IPE program.

MATERIALS AND METHODS

A descriptive observational study with a cross-sectional approach was conducted to evaluate the competence of undergraduate medical students in implementing IPC after completing the Interprofessional Education (IPE) program. The study population consisted of undergraduate medical students enrolled at the Faculty of Medicine, Udayana University. The sample included 83 students from the 2022 cohort who had completed the IPE program. Participants were selected using a consecutive sampling technique based on eligibility and consent to participate. The outcome variable in this study was the level of IPC competence. Data were collected using the Interprofessional Collaborative Competencies Attainment Survey (ICCAS), which assesses six domains: communication, collaboration, roles and responsibilities, patient/family-centered approach, conflict management, and team functioning. ICCAS has been previously reported as a valid and reliable instrument for measuring interprofessional collaborative competencies. Data were obtained by distributing an online questionnaire to eligible students after the completion of IPE activities. Participants were informed of the study objectives and confidentiality assurance before completing the instrument. Data were analyzed descriptively to determine median, minimum, and maximum values for each competency domain. The Kolmogorov–Smirnov test was applied to assess data normality. Due to non-normal distribution of data,categorization was based on the median value of each domain. This study was approved by the Research Ethics Committee, Faculty of Medicine, Udayana University, with the ethical approval number: 1312/UN14.2.2.VII.14/LT/2025.

RESULT

A total of 83 medical students participated in this study. The distribution based on gender is presented in **Table 1.**

Table 1. Distribution of respondents by gender

Gender	Frequency (n)	Percentage (%)
Male	30	36.1
Female	53	63.9
Total	83	100

Descriptive analysis of IPC competency domains including median, minimum, and maximum values is

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shown in **Table 2.**

Table 2. Descriptive statistics of IPC competency domains

Domain	Median	Min	Max
Communication	26.0	15.0	35.0
Collaboration	16.0	7.00	21.0
Roles and Responsibilities	23.0	11.0	28.0
Patient/ Family Centered Approach	17.0	6.00	21.0
Conflict Management	17.0	9.00	21.0
Tim Functioning	11.0	5.00	14.0

Communication had the highest median score among all IPC domains, indicating relatively better performance compared to other aspects. Meanwhile, the lowest median value was observed in the team functioning domain, suggesting that students may still face challenges in working collaboratively within interprofessional teams.

Based on median categorization, the competency levels are shown in **Table 3.**

Table 3. Classification of IPC competency levels

Domain	Good n(%)	Low n (%)
Communication	41 (49.4%)	42 (50.6%)
Collaboration	33 (39.8%)	50 (60.2%)
Roles and Responsibilities	38 (45.8%)	45 (54.2%)
Patient/ Family Centered Approach	35 (42.2%)	48 (57.8%)
Conflict Management	39 (47.0%)	44 (53.0%)
Tim Functioning	36 (43.4%)	47 (56.6%)

The classification results show that the majority of students fall into the low competency category across all domains. The highest percentage of low competency was found in collaboration and team functioning, highlighting the need for enhanced IPE activities that provide real collaborative experiences to strengthen these skills. Overall, a greater proportion of respondents demonstrated low competency across all IPC domains. The highest proportion of good competency was observed in communication (49.4%), whereas the lowest was found in collaboration (39.8%) and team functioning (43.4%). Overall, the descriptive findings suggest variability in IPC competency attainment among students, with certain domains demonstrating relatively better performance than others. This variation indicates that IPC competencies may develop unevenly depending on learning exposure, instructional emphasis, and opportunities for practical collaboration. These results provide an initial overview of students' strengths and weaknesses in IPC, which can serve as baseline information for future educational evaluation and program refinement.

Overall, the distribution of IPC competency levels across domains shows a consistent dominance of low competency among respondents. Although communication achieved the highest median score and the largest proportion of students categorized as having good competency, nearly half of the participants remained in the low competency category for this domain. This indicates that while basic communication skills may be relatively well developed, their consistent application within interprofessional contexts is still limited. In contrast, collaboration and team functioning emerged as the weakest domains, with more than half of the students classified as having low competency. These findings suggest challenges in engaging in shared decision-making, coordinating tasks, and functioning effectively within interprofessional teams. Similarly, the domains of roles and responsibilities, patient/family-centered approach, and conflict management were dominated by low competency classifications, indicating limited readiness to clarify professional roles, integrate patient perspectives, and manage interpersonal differences in collaborative settings.

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Taken together, the results indicate variability in IPC competency attainment across domains, with interpersonal communication showing relatively better performance than competencies requiring deeper interprofessional integration. This uneven pattern suggests that IPC skills may develop gradually and unevenly, depending on students' exposure to authentic collaborative experiences during training. Overall, these descriptive findings provide a baseline overview of students' IPC competency profiles and highlight specific areas that may benefit from targeted educational interventions and future IPE program refinement.

DISCUSSION

This study demonstrated that most students showed low competency across IPC domains despite having participated in the IPE program. These findings indicate that the development of collaborative skills among preclinical students remains suboptimal. Similar results have been reported in studies conducted in several institutions, where students often struggle to transfer theoretical IPE learning into active collaborative roles in practice.[13] Communication was the domain with the highest proportion of good competency. This could be attributed to the fact that communication skills are introduced early and continuously reinforced throughout medical education. Strategies such as small group discussions and case-based learning may contribute to better communication readiness.[14,15] However, the proportion of students still categorized as low remains notable, suggesting that communication in interprofessional settings requires more explicit and applied training.[16] Collaboration and team functioning were the domains with the lowest levels of competence. Limited exposure to direct interprofessional interactions during preclinical training may reduce students' confidence in collaborating with other professions.[17,18] In the early stages of training, students may prioritize the development of individual knowledge and clinical skills rather than collaborative abilities. Roles and responsibilities, patient-centeredness, and conflict management also showed low competency levels in most participants.[17]

This finding suggests that students may still have limited understanding of the distribution of professional responsibilities and practical teamwork dynamics within healthcare environments. Previous research has highlighted that insufficient real-world interprofessional experiences may contribute to poor confidence in handling conflict and prioritizing patient-centered decision making.[18,19,20] The predominance of low competency levels across IPC domains highlights the challenges of translating interprofessional learning concepts into practical collaborative skills. While IPE provides theoretical understanding and limited experiential learning, students may require more sustained and immersive interprofessional encounters to develop confidence and competence. Previous studies have emphasized that short-term or isolated IPE activities may be insufficient to foster deep collaborative behaviors, particularly in domains such as role clarification, shared decision-making, and team dynamics.[18]

Furthermore, the findings suggest that IPC competency development is influenced not only by curriculum design but also by institutional culture and learning environment. Students who are primarily trained within single-profession settings may have fewer opportunities to observe effective interprofessional role models. This lack of exposure may contribute to uncertainty in professional identity formation and reluctance to engage actively in interprofessional collaboration. Strengthening faculty collaboration and integrating interprofessional role modeling into teaching activities may therefore enhance the effectiveness of IPE programs.[19]

The strengths of this study include the use of a validated instrument and the involvement of a complete cohort that had undergone IPE. However, the study has limitations, particularly as data were collected only after IPE completion without baseline measurement, which restricts the ability to evaluate competency improvement. Additionally, responses were self-reported, which may introduce bias. Overall, the findings emphasize the need for enhanced and innovative IPE strategies, including increasing the duration of interprofessional exposure and incorporating simulation or clinical-based collaborative activities. These efforts are crucial to preparing students for effective teamwork in healthcare settings.[12] These results underscore the importance of aligning IPE learning outcomes with assessment strategies that capture authentic collaborative performance. Reliance on self-assessment instruments, while useful for reflective purposes, should ideally be complemented with observational or performance-based assessments to provide a more comprehensive evaluation of IPC competence. Such an approach may allow educators to identify specific competency gaps and tailor educational interventions more effectively.[24,25]

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CONCLUSION AND SUGGESTION

This study revealed that the overall level of IPC competence among undergraduate medical students at Udayana University remains suboptimal, with the majority of students classified into the low competency category across all IPC domains. Despite communication being the strongest domain, competencies related to collaboration, team functioning, and patient-centered care continue to require improvement. These findings suggest that the current IPE implementation during preclinical training has not yet fully facilitated the acquisition of essential collaborative skills. In a broader perspective, the findings of this study highlight that IPC competence among undergraduate medical students is influenced by the complexity of interprofessional learning processes and the learning context in which IPE is delivered. The dominance of low competency levels across most domains suggests that competency acquisition in interprofessional collaboration is not an automatic outcome of program participation, but rather requires structured, continuous, and contextually relevant learning experiences. These results reinforce the notion that collaborative competence develops progressively and must be supported by curricular integration, adequate learning time, and meaningful interaction among different health professions. As such, the present study provides important baseline evidence for medical education stakeholders to critically reflect on the effectiveness of existing IPE models and their alignment with expected IPC learning outcomes.

Strengthening IPE strategies is recommended, particularly through increased exposure to simulation-based teamwork, interprofessional role engagement, and clinical-based collaborative practice. Future studies should consider a pre–post assessment design to more accurately evaluate competency improvements following IPE. Further research is also needed to explore factors that influence students' readiness for collaborative practice, enabling continuous enhancement of IPE programs to better prepare future healthcare professionals for interprofessional teamwork in real clinical settings.

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