



Are midwifery students ready for interprofessional education with project-based learning?

Ari Indra Susanti¹, Ariyati Mandiri², Lani Gumilang³

^{1,2,3} Universitas Padjadjaran, Sumedang, Indonesia

ari.indra@unpad.ac.id¹, ariyati.mandiri@unpad.ac.id², lani.gumilang@unpad.ac.id³

ABSTRACT

Patient-centered health services require preparation for Interprofessional Collaboration (IPC). Therefore, it is essential to equip health worker students with Interprofessional Education (IPE) training. This study aims to determine the readiness of midwifery students to implement Interprofessional Education (IPE) using a Project-Based Learning (PjBL) approach. A descriptive research method with a cross-sectional design was conducted at the Midwifery Study Program, Faculty of Medicine, Universitas Padjadjaran. Data collection was performed using questionnaires administered to 30 students (7th semester) before the start of PjBL, who collaborated with nursing students in the Undergraduate Nursing Study Program at Universitas Padjadjaran. Descriptive data analysis with frequency and percentage statistical tests. The study's results showed that midwifery students were highly receptive to IPE learning, which involves working together to solve patient problems, benefiting from learning related to professional limitations, communication skills, teamwork skills, and collaboration in small group settings. Additionally, most midwifery students can participate in IPE by achieving a score of 79.50-100. This study concludes that student readiness can support the achievement of PjBL-based IPE learning objectives.

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ABSTRAK

Pelayanan kesehatan yang berpusat pada pasien perlu dipersiapkan Interprofessional Collaboration (IPC), maka perlu membekali mahasiswa tenaga kesehatan dengan pembelajaran Interprofessional Education (IPE). Penelitian ini bertujuan mengetahui kesiapan mahasiswa kebidanan melaksanakan IPE berbasis Project-Based Learning (PjBL). Metode penelitian deskriptif dengan cross sectional yang dilakukan di Program Studi Kebidanan Fakultas Kedokteran Universitas Padjadjaran. Pengumpulan data menggunakan kuesioner yang diberikan kepada 30 mahasiswa (semester 7) sebelum dimulai PjBL yang berkolaborasi dengan mahasiswa keperawatan di Program Studi Sarjana Keperawatan Universitas Padjadjaran. Analisis data deskriptif dengan uji statistik frekuensi dan persentase. Hasil penelitian didapatkan mahasiswa kebidanan sangat siap dalam pembelajaran IPE yang bertujuan untuk bekerja sama untuk memecahkan masalah pasien, manfaat pembelajaran terkait keterbatasan profesional, keterampilan komunikasi, keterampilan kerja tim, dan kolaborasi dalam pembelajaran kelompok kecil. Selain itu, sebagian besar mahasiswa kebidanan dapat melakukan IPE dengan mendapatkan nilai 79.50-100. Simpulan penelitian ini, kesiapan mahasiswa dapat mendukung tercapainya tujuan pembelajaran IPE berbasis PjBL.

Kata Kunci: interprofessional education; kesiapan mahasiswa; pembelajaran berbasis proyek

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INTRODUCTION

The increasing number of comorbidities among patients leads to the complexity of care, necessitating interprofessional collaboration (IPC) as an essential component of the healthcare system (Bouton et al., 2023). To overcome these health problems, better collaboration is needed between professions that focus on patients or users of health services (Ahmady et al., 2020). Collaboration can be carried out effectively if there is a professional attitude and experience to carry out health care with IPC. Interprofessional collaboration yields improved processes, quality, cost-effectiveness, and outcomes in healthcare (Bos, 2020). Interprofessional cooperation and collaboration is one of the strategies to reform and improve health services, reduce morbidity and mortality rates, and optimize care. Additionally, it can reduce unnecessary work and increase job satisfaction (Homeyer et al., 2018). To prepare healthcare workers for patient-centered health services, it is necessary to equip them with Interprofessional Education (IPE) learning (Alharbi et al., 2024).

Based on the results of the scoping review, IPE learning can be carried out by two or more types of health professions that discuss health topics (McLean et al., 2024). IPE in health involves collaborative, interactive learning of skills through effective teamwork supported by interprofessional collaboration (Ogata et al., 2021). In addition, scoping review results indicate that IPE learning models can be categorized into three types: partially integrated interprofessional models, fully integrated interprofessional models, and models designed to develop interprofessional skills gradually. However, in a fully integrated interprofessional curriculum, the focus will be on patients, providing them with appropriate care. Therefore, there will be a shift from profession-based care to expertise-based care that will be provided by a team of skilled health professionals (Grace, 2021).

One of the efforts to develop the IPE curriculum involves identifying the professional values that health students must possess in order to work together and collaborate interprofessionally by modifying activities carried out in educational institutions (Muktamiroh et al., 2019). One of the IPE learning activities using the PjBL method aims to improve teamwork (Sakulviriyakitkul et al., 2020). IPE based on PjBL allows students to engage in collaborative projects that simulate real-world healthcare scenarios, fostering critical thinking, problem-solving, and interprofessional competencies that are crucial in delivering comprehensive patient care. The structured approach of PjBL within the IPE framework ensures that students develop not only theoretical knowledge but also practical experience in team-based healthcare service delivery (Prior et al., 2022). This integration strengthens their readiness to collaborate in diverse healthcare settings, ultimately impacting the quality and efficiency of healthcare services (Gooding et al., 2022).

Additionally, PjBL in IPE enables students to gain a deeper understanding of each profession's role within the healthcare team, facilitating improved communication and coordination in practice. Through problem-solving and collaborative learning, students enhance their ability to make evidence-based decisions, manage complex patient cases, and adapt to the dynamic nature of healthcare. The application of PjBL in IPE also fosters a patient-centered approach by ensuring that students develop the necessary skills to provide holistic and coordinated care (Shakhman et al., 2020). Furthermore, PjBL-based IPE enhances students' ability to work in interdisciplinary teams by integrating leadership skills, ethical decision-making, and conflict resolution strategies. As healthcare challenges become more complex, professionals must be well-equipped to collaborate across disciplines, ensuring that patient care is both comprehensive and efficient. Studies have shown that students who participate in PjBL-based IPE demonstrate a higher level of engagement, retention of knowledge, and ability to translate their learning into practice (Koo et al., 2022). This suggests that incorporating PjBL into IPE curricula can have a long-term impact on workforce readiness and patient care outcomes (Zenani et al., 2023).

The results of a systematic review revealed that IPE has a positive impact on students' knowledge of other professions, the development of teamwork skills, and changes in collaborative behavior, as well as the IPE learning process (Aldriwesh et al., 2022). However, the results of the learning evaluation, based on the integrated review, showed that IPE had an impact that was not only measured by student perceptions but also by factors related to the effectiveness of IPE and various methods and instruments for learning evaluation. This contributed to the development of IPE in the future health education curriculum (Au, 2023). Thus, this study aims to determine the readiness of midwifery students to implement IPE based on PjBL and assess its impact on improving interprofessional collaboration skills, ultimately contributing to better healthcare services (van Diggele et al., 2020).

Moreover, evaluating the effectiveness of PjBL-based IPE requires a multi-faceted approach, including qualitative and quantitative assessments of student competencies, feedback from educators, and longitudinal tracking of professional performance in clinical settings. By refining and enhancing IPE methodologies, educational institutions can ensure that health students are better prepared for interprofessional practice, leading to improved patient outcomes and more efficient healthcare delivery. The integration of PjBL in IPE not only benefits students but also strengthens the overall healthcare system by fostering a workforce that is skilled in teamwork, communication, and patient-centered care (van Diggele et al., 2020). Although IPE has been widely studied, research on its implementation using PjBL in midwifery education remains limited. Previous studies have primarily focused on student perceptions rather than measurable improvements in interprofessional collaboration skills (Aldriwesh et al., 2022). Additionally, the long-term impact of PjBL-based IPE on professional practice remains unclear. Therefore, this study aims to assess the readiness of midwifery students in implementing PjBL-based IPE and its effectiveness in enhancing interprofessional collaboration. Therefore, this study aims to determine the readiness of midwifery students in implementing IPE based on PjBL.

LITERATURE REVIEW

Interprofessional Education (IPE)

Interprofessional Education (IPE) in health involves interactive, shared learning of collaborative skills for effective teamwork guided by interprofessional collaboration. It aims to improve health practice through the education of workers in groups (Ogata et al., 2021). As a structured approach, IPE enhances the ability of healthcare professionals to work together by integrating theoretical knowledge with practical applications, fostering a team-based approach to patient care. A systematic review identified teamwork as one of the most frequently developed competencies in IPE, highlighting its role in improving role clarity, communication, and collaboration among healthcare professionals (Patel et al., 2025). Based on a systematic review, the effectiveness of IPE in clinical practice, when incorporated into the academic curriculum, provides evidence-based insights to improve patient safety standards, optimal patient health, and the quality of healthcare (Shuyi et al., 2024).

Interprofessional collaboration and education have become crucial components of clinical and educational programs, thereby enhancing patient care and student development (Baecher-Lind et al., 2022). This integration not only refines teamwork and communication skills but also ensures that graduates are prepared to navigate the complexities of modern healthcare systems (Patel et al., 2025). Despite the many benefits of IPE, its implementation continues to face several challenges. One major obstacle is the lack of standardized guidelines, leading to inconsistencies in interprofessional learning experiences. Additionally, differences in professional culture and hierarchical structures may restrict effective communication and collaboration among students from various healthcare fields (Son et al., 2024).

Project-Based Learning (PjBL)

Project-based learning (PjBL) aims for nursing students to participate in solving real-world problems by building knowledge and improving their nursing skills through the completion of meaningful projects (Koo et al., 2022). Based on the literature review, PjBL has an impact on students' creative thinking and supports the use of engaging assistive media or student worksheets that align with PjBL (Winarko, 2024). PjBL can enhance students' creative thinking skills, which are related to student learning outcomes (Mursid et al., 2022). PjBL provides students with hands-on learning experiences that encourage them to explore multiple solutions, adapt various approaches, and develop innovative ideas when addressing challenges in midwifery education (Athaya et al., 2024; Syawalia et al., 2023). Research suggests that PjBL fosters problem-solving skills by immersing students in real-world scenarios, enhancing their ability to think critically and creatively (Ilafi et al., 2024). Moreover, problem-solving-based interprofessional learning enhances teamwork and communication by enabling students to collaborate with peers from diverse healthcare disciplines. These experiences not only prepare students for professional practice in complex healthcare environments but also enhance their ability to work effectively in collaborative settings, ultimately improving patient care outcomes (Aein et al., 2020).

METHODS

This research method employs a descriptive cross-sectional study conducted in the Midwifery Study Program, Faculty of Medicine, Universitas Padjadjaran, involving 150 students. This research is part of the IPE module learning process for one semester, based on an integrated curriculum in collaboration with the Undergraduate Study Program, Faculty of Nursing, Universitas Padjadjaran. The IPE module applies PjBL as a learning method to enhance students' interprofessional collaboration skills. The IPE learning process, as outlined in the Rencana Pembelajaran Semester (RPS or Semester Learning Plan), is presented in **Table 1**.

Table 1. IPE Learning Stages Based on PjBL

Course learning Outcomes (CPMK)	Stages	Assesment
Applying the principles and values of interprofessional communication in planning and providing patient-centered services safely, efficiently, and effectively, tailored to each case. (K3A3P1)	This research method employs a descriptive cross-sectional study conducted in the Midwifery Study Program, Faculty of Medicine, Universitas Padjadjaran, involving 150 students. This research is part of the IPE module learning process for one semester, based on an integrated curriculum in collaboration with the Undergraduate Study Program, Faculty of Nursing, Universitas Padjadjaran.	Assessment uses an assessment rubric to assess the preparation of scenarios in the form of reports.
Students carry out Interprofessional Education Collaboration (IPEC)	Role-play and Reflective Practice with student activities playing roles as health professionals based on scenarios created.	Assessment utilizes an assessment rubric to evaluate the roles of all health professions based on various scenarios.
Implementing the IPCP concept in integrated case management and education	Observation of IPC at Unpad Hospital (RSU) involved conducting situational analysis related to IPC at RSU, after which the results of the analysis were presented in the form of Posters and Articles.	Assessment using an assessment rubric for presenting the results of the situation analysis

Source: Research (2024)

PjBL is implemented through collaboration between midwifery students and nursing students. Therefore, PjBL preparation is coordinated between nursing lecturers and midwifery lecturers to achieve the IPE learning objectives. **Figure 1** shows the IPE Learning Method Based on PjBL.

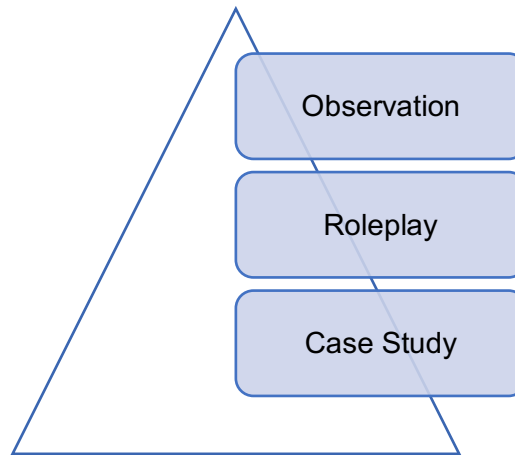


Figure 1. IPE Learning Method Based on Project-Based Learning (PjBL)
Source: Semester Learning Plan for IPE Module (2024)

One of the Learning Outcomes of IPE Courses (CPMK) based on PjBL is that students can collaborate with professionals through three stages of PjBL activities (**Figure 1**) to create reports presented in the form of posters and articles. At the beginning of the IPE module lecture, students were given a questionnaire to assess their readiness in implementing IPE. The total number of students participating in the IPE activities was 150, consisting of both midwifery and nursing students. However, for this study, a sample of 30 midwifery students (D4 Midwifery, semester 7) was selected using purposive sampling, focusing on students who were actively involved in PjBL-based IPE activities. The IPE dimensions in the Questionnaire are student readiness to carry out IPE (**Table 2**) and data analysis of the questionnaire results using descriptive statistics.

Table 2. Dimensions in the IPE Readiness Questionnaire

No.	Dimension	No. Item Statement
1	IPE Learning Objectives	1, 2, 3, 18, 19
2	Benefits of IPE Learning	6, 7, 8, 17
3	Communication skills	4, 13
4	Teamwork skills	5, 14, 15, 16, 20
5	Collaboration skills	9, 10, 11
6	Clinical problem-solving skills	12, 19

Source: Research (2024)

This questionnaire utilizes research results from the article "Evaluating Interprofessional Education Readiness and Perceptions Among Health Professions Students" ([Alharbi et al., 2024](#)).

RESULT AND DISCUSSION

Interprofessional Education (IPE) is an integral educational perspective that is necessary to ensure that graduates of integrated healthcare education can become members or leaders of collaborative healthcare practices. Literature and resources are available on various models that institutions have used to integrate IPE into their health education curricula. As the need for collaborative practice increases, curricula must be designed to develop the competencies necessary for IPE. Therefore, with the combined efforts of administration, faculty, and students, the benefits of IPE can be enjoyed by institutions and patients alike (Shakhman et al., 2020).

Table 3. Midwifery Students' Readiness in IPE Regarding IPE Learning Objectives

No. Statement	Statement	SS		S		N		TS		STS	
		n	%	n	%	n	%	n	%	n	%
1	Studying with other health profession students will help me become a more effective member of the healthcare team.	13	43.30	12	40	5	16.70	0	0	0	0
2	Patients will ultimately benefit if students from different health professions (doctors, midwives, nurses, etc.) work together to solve patient problems.	21	70.00	9	30.00	0	0	0	0	0	0
3	Collaborative learning with other health students will improve my ability to understand clinical problems.	11	36.70	13	43.30	6	20	0	0	0	0
18	I am not sure what my professional role will be	0	0	1	3.30	6	20.00	13	43.30	10	33.30
19	I have to gain more knowledge and skills than other health profession students.	9	30.00	12	40.00	8	26.70	1	3.30	0	0

Note: SS (Strongly Agree), S (Agree), N (Neutral), TS (Disagree), STS (Strongly Disagree)

Source: Research (2024)

Table 3 shows that most midwifery students strongly agree with the following: learning to become a member of a healthcare team (43.30%) and working together to solve patient problems (70%). Meanwhile, most stated that they agree to improve my ability to understand clinical problems by 43.30% and gain more knowledge and skills by 40%. However, most stated that they disagree if they are not sure about the role of the profession later by 43.30%. IPE is a learning activity for students from various health professions who practice to the final level in the process and explore the boundaries of professional health practice. At the same time, they learn how to have effective interprofessional relationships through collaborative sharing of skills and knowledge. IPE occurs when two or more health professions learn together, learn from each other, and understand the roles of each profession to enhance collaboration skills and improve the quality of healthcare services. Collaboration occurs when individuals respect each other and their respective professions and are willing to participate in a cooperative atmosphere. The purpose of IPE is the practice of interprofessional collaboration, which involves various professions learning how to work together by acquiring the knowledge, skills, and attitudes needed to collaborate effectively. IPE

competencies comprise four components: knowledge, skills, team orientation, and team abilities (Putriana & Saragih, 2020).

Table 4. Midwifery Students' Readiness for the Benefits of IPE Learning

No. Statement	Statement	SS		S		N		TS		STS	
		N	%	n	%	n	%	n	%	n	%
6	Collaborative learning will help me understand my professional limitations.	13	43.30	11	36.70	6	20	0	0	0	0
7	Studying with students across health professions prior to qualification will enhance relationships after qualification.	12	40.00	10	33.30	8	26.70	0	0	0	0
8	Peer learning will help me develop a more positive perspective on other healthcare professionals.	14	46.70	8	26.70	8	26.70	0	0	0	0
17	The nursing and therapeutic professions can provide support for doctors.	6	20.00	19	63.30	5	16.70	0	0	0	0

Note: SS (Strongly Agree), S (Agree), N (Neutral), TS (Disagree), STS (Strongly Disagree)
Source: Research (2024)

Table 4 shows that most midwifery students strongly agree that the benefits of IPE learning can help them understand professional limitations (43.30%), improve interprofessional relationships (40.00%), and foster a positive outlook (46.70%). However, 63.30% of midwifery students agreed that they could provide interprofessional support. Interprofessional learning (IPL) or, more broadly, IPE, refers to a pedagogical approach that involves creating learning experiences in which students from different professions learn from, with, and about each other (Alharbi et al., 2024). IPE is a significant trend in global health that aims to enhance human health resources, thereby drawing the attention of health decision-makers (Medina-Córdoba et al., 2024).

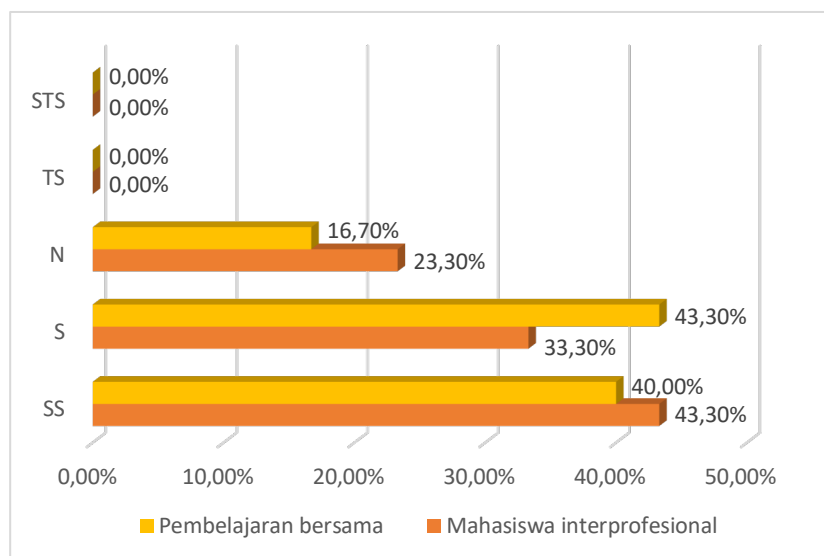


Figure 2. Communication Skills in IPE
Source: Research (2024)

Figure 2 shows that the majority of midwifery students strongly agree that communication skills should be learned alongside other health profession students (43.30%) and that learning together with other health students will help them communicate more effectively with patients and other health professionals (43.30%). Effective communication and collaboration must be strengthened in all professional healthcare programs to ensure patient satisfaction and safety (Rokhmah & Anggorowati, 2017). Interprofessional communication is considered one of the most important core competencies of the Interprofessional Education Collaborative (IPEC). This integration not only refines teamwork and communication skills but also ensures that graduates are prepared to navigate the complexities of modern healthcare systems (Patel et al., 2025). Although attitudes towards IPC among healthcare professionals are generally very positive, many healthcare professionals face challenges in participating in IPC. Online distance learning and interaction, as well as IPE enhanced by simulation.

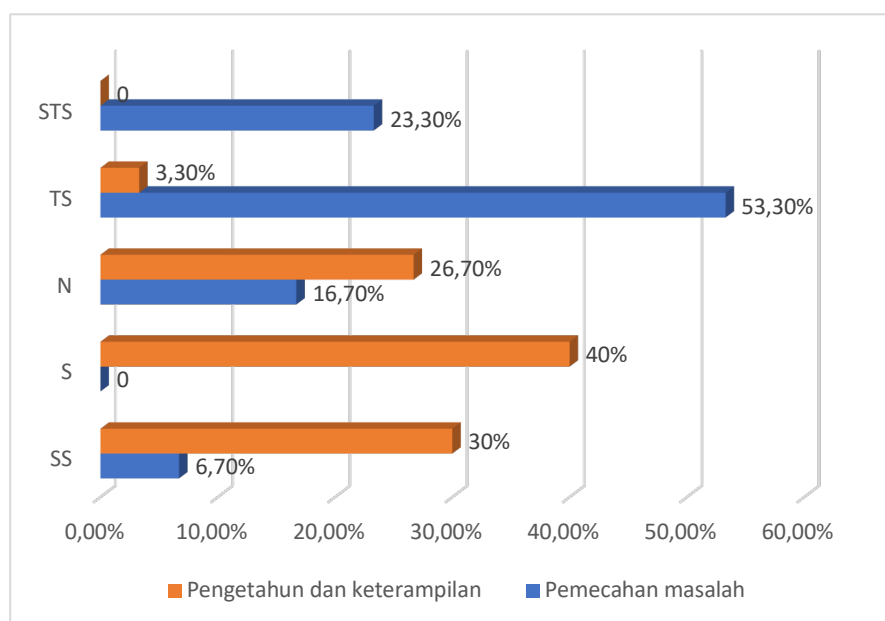


Figure 3. Problem Solving Skills in IPE
Source: Research (2024)

Figure 3 shows that the majority of midwifery students (53.30%) believe that clinical problem-solving skills can only be learned by students from my college and that they must acquire more knowledge and skills than students in other health professions (40%). The Core Professional Education Collaboration (IPEC) has four core competencies: values and ethics, roles and responsibilities, interprofessional communication, and teamwork. Assessed. IPC facilitates efficient patient care, enhances patient problem-solving skills, and leads to improved clinical outcomes for patients. They acknowledge that IPC encourages mutual respect within the health care team and the ability of service providers to make optimal patient care decisions.

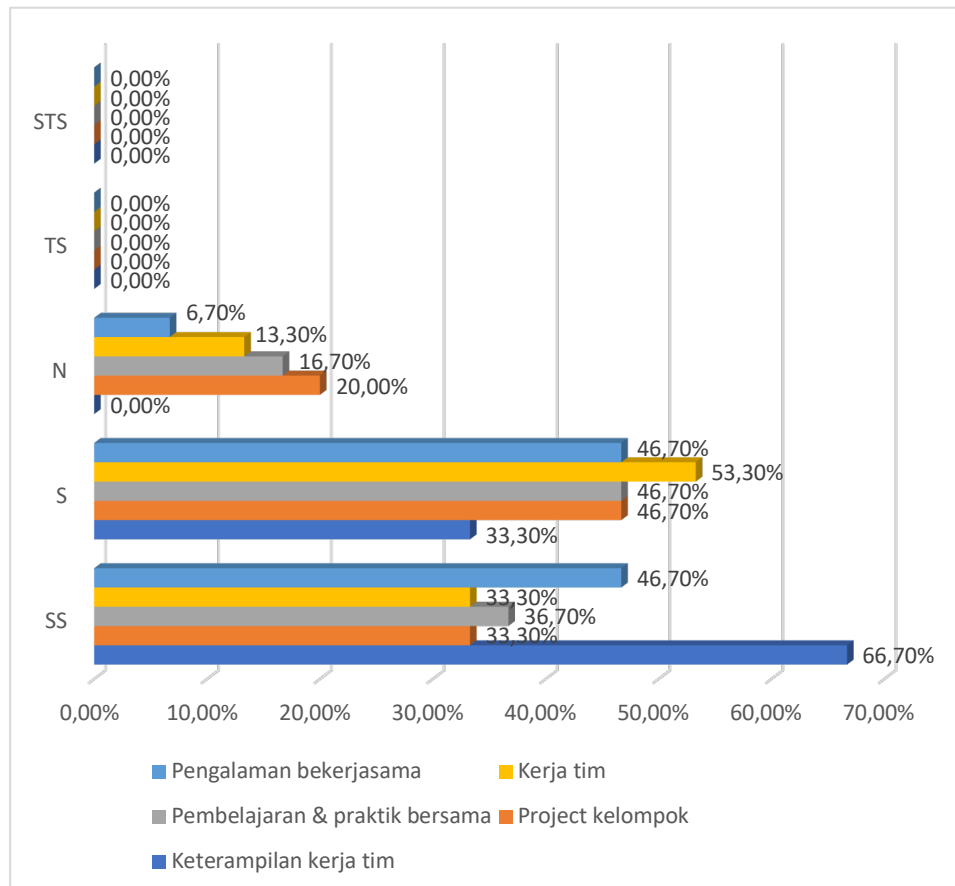


Figure 4. Teamwork Skills in IPE
Source: Research (2024)

Figure 4 shows that the majority of midwifery students who responded strongly agree that teamwork skills are essential for all health profession students to learn, at 66.70%. The majority of students' readiness states indicate that they will utilize the opportunity to work on small group projects with other health profession students and that learning and practicing together with other health professions will help them explain the characteristics of patient problems by 46.7%. In addition, agreeing to learn together with other health professions before qualification will help me become a better team player by 53.30% and gain experience in working with other health professions in dealing with patient problems by 46.70%.

Establishing an interprofessional identity is crucial in preparing healthcare teams to work in collaborative environments and enhance the effectiveness of patient care. Accreditation standards for health professions programs have been implemented to include IPE. Findings suggest that role-playing and team-based case discussions for IPE can have a positive impact on students' interprofessional perceptions and understanding (Ciani et al., 2023). Implementing IPE strategies can increase students' interest in engaging in Interprofessional Shared decision-making (IP-SDM). Interprofessional collaboration among team members, adherence to team-based care principles, and administrative support at multiple levels may be factors that influence participants' interest in engaging in IP-SDM (Keshmiri et al., 2020). IPE in health involves interactive, shared learning of collaborative skills for effective teamwork guided by interprofessional collaboration. It aims to improve health practice through the education of workers in groups (Ogata et al., 2021).

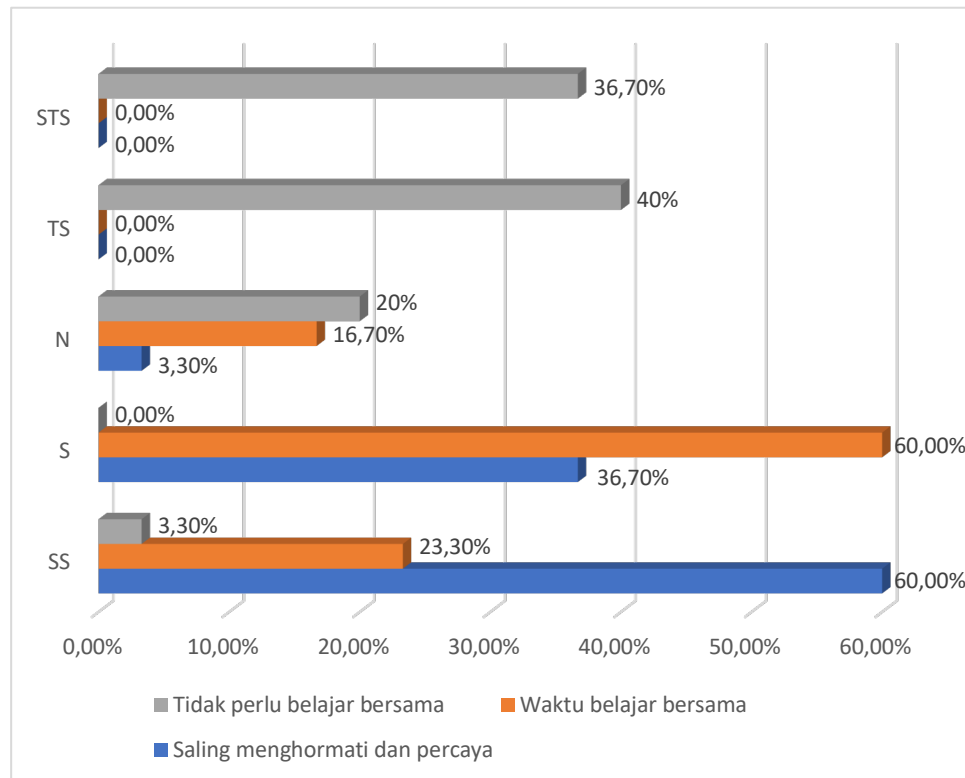


Figure 5. Collaboration Skills in IPE
Source: Research (2024)

Figure 5 shows that the majority of midwifery students' readiness is stated as strongly agreeing that conducting small-group learning can be successful, with 60% of students from health professions needing to respect and trust each other. However, 40% of midwifery students stated that undergraduate health profession students do not need to study together by a margin of 40%. The PjBL-based IPE learning process can develop students' soft skills, including teamwork, project management, communication, and interpersonal skills (Syahril et al., 2021). Based on the literature review, PjBL has an impact on students' creative thinking and supports the use of engaging assistive media or student worksheets that align with PjBL (Winarko, 2024). PjBL can enhance students' creative thinking skills, which are related to student learning outcomes (Mursid et al., 2022).

Table 5. PjBL Based IPE Assessment Results

Score	Quality Letters	Total
79.50-100	A	22
67.50-79.50	B	8

Source: Evaluation Results IPE (2024)

Table 5 shows that most midwifery students can effectively carry out PjBL-based IPE by compiling scenarios, conducting role-plays, and presenting the results of IPE analysis, achieving a score of 79.50-100. Thus, the results of this study are supported by the findings of research conducted at the University of Jember, which indicate that the PjBL method can enhance knowledge and critical thinking among nursing students. Nursing educational institutions can consider incorporating the PjBL method in curriculum design to create more effective learning strategies to improve the quality of nursing education (Maisyaroh et al., 2023).

Based on the scoping review, IPE is a process where two or more professions learn together to create effective collaboration and improve healthcare outcomes. The articles highlight the primary challenges in the development and implementation of IPE, including a lack of consistency and standards, limited resources and institutional support, cultural differences, and traditional hierarchies. Strategies to address these challenges include faculty training and development, policy stakeholder support, systematic curriculum integration, development and innovation, as well as case-based and simulation approaches. The positive impact of IPE enhances knowledge, skills, and attitudes among students and healthcare professionals, fostering better teamwork and collaboration. The development and implementation of IPE in health education curricula require a multifaceted approach that addresses challenges through strategic solutions (Son et al., 2024).

CONCLUSION

The objectives of IPE learning with PjBL can be achieved because they are supported by student readiness. IPE learning aims to establish cooperation between health students in solving patient problems, recognizing the benefits of learning related to professional limitations, and developing communication skills, teamwork, and collaboration in small group settings. Thus, most midwifery students are ready to participate in IPE by achieving a score of 79.50-100. However, several aspects still need further development, including communication skills and teamwork. Strengthening these aspects can further improve students' ability in interprofessional collaboration. Future research should focus on implementing PjBL-based IPE in real clinical settings to assess its effectiveness in professional practice. Furthermore, additional studies can investigate the role of technology and digital simulations in enhancing interprofessional collaboration and enhancing student learning experiences.

AUTHOR'S NOTE

This article has no conflicts of interest and confirms that both the research data and its content are free from plagiarism.

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