

Healthcare Undergraduates' Attitudes and Readiness Toward Interprofessional Education at a Saudi University

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Objective: Interprofessional education (IPE) is widely recognized as an effective practice in healthcare education that helps healthcare students understand different professional roles, and values related to collaboration, teamwork, and leadership within healthcare teams. This study was conducted to measure attitudes and readiness for IPE among healthcare students at Taif University and to explore any differences in students' attitudes in relation to their healthcare program, year of study and other related factors.

Methods: Healthcare undergraduates participated in a cross-sectional study conducted from January 2024 to March 2024. Data was collected electronically by filling out an electronic version of The Readiness for Interprofessional Learning Scale (RIPLS), which was sent to students in advanced years of study, 3rd year and higher, depending on the program. Data was analyzed descriptively and statistically using appropriate univariate and bivariate analyses.

Results: A total of 263 healthcare students participated in the study (68.8% female, 31.2% male), and the majority were from pharmacy program (55.1%), followed by nursing (25.1%) and medicine (19.8%). The overall RIPLS score for all students was 76.58, indicating positive attitudes towards IPE. The RIPLS score differed significantly ($P=0.01$) in relation to the program of study, with nursing students showing the highest readiness (77.59), and medical students showed the least (73.56). For the other factors, no significant difference was found in RIPLS scores in relation to gender, clinical training experience, attending previous IPE sessions, or the year of study.

Conclusion: Attitudes and readiness for IPE among healthcare undergraduates at Taif University were positive, particularly among nursing students. The reasons behind differences in readiness for IPE among programs need further investigation by researchers and healthcare educators. Offering introductory sessions to introduce the concept of IPE to healthcare programs with lower readiness might be helpful to raise students' awareness of the value of IPE.

Keywords: IPE, interprofessional education, undergraduates, readiness to IPE, RIPLS, healthcare student, attitude, Saudi university

Introduction

The healthcare field is vast and constantly changing, requiring skilled and empathetic professionals who can communicate and collaborate effectively to provide fair, affordable, and efficient care. Collaborative skills have been recognised among the core skills healthcare workers need to acquire to be an effective member in multidisciplinary team (MDT) environments.^{1,2}

Interprofessional education (IPE) is internationally recognised across healthcare subfields as an effective way to prepare professionals to work efficiently in healthcare teams.^{1,3} In several countries around the world, most healthcare programs have implemented IPE activities, as required by healthcare accreditation bodies.^{4,5} According to the World Health Organization, IPE occurs "when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes".⁶ Through enabling students to learn with, from, and about one another, IPE aims to break down professional silos and foster a positive attitude towards collaborative approaches.⁷

Based on the accumulative evidence, IPE is considered a useful approach for students to learn about various roles, values, and perspectives of different professions, as well as the essential skills in collaboration, teamwork, and leadership within MDT.^{1,8} Students from a variety of healthcare disciplines, including medicine, nursing, pharmacy, dentistry, and allied health professions, are brought together to learn informally and work in teams. Systematic reviews of IPE have found evidence that it promotes beneficial interaction among diverse professions and improves attitudes toward other professionals.^{9,10} Thus, the major objective of IPE is to encourage effective collaboration and communication among prospective healthcare professionals with the goal of enhancing the quality of patient care.¹¹

According to several theories from education and sociology, including contact theory, adult learning theory, community of practice and others, it is thought that for learners to achieve IPE purpose, the learning process in IPE sessions undergoes three phases.^{12,13} First is changing attitudes towards other professionals by reducing prejudices towards other professions and limiting stereotypical thinking. Therefore, enhancing attitudes is necessary for learners to progress to the following phases. The second phase involves enhancing learners' knowledge about the roles of other professionals, where learners show respect for other professionals. In the third phase, learners can advance to the level where, through learning and working with other professionals, they develop collaborative competencies. Given that, exploring learners' attitudes before implementing IPE is an important step to make implementation plans accordingly. Furthermore, evidence has shown that lack of awareness of IPE can impact students' willingness to attend IPE sessions.^{14,15}

Over the last decade, IPE in the Middle East region has gained recognition in healthcare and related fields. Several Middle Eastern countries, such as Qatar, Lebanon, and the UAE have shown a growing interest in implementing IPE initiatives to enhance healthcare outcomes, promote interdisciplinary collaboration, and address the complex healthcare needs of their populations.¹⁶ In Qatar, established IPE programs and the publication of several IPE studies have contributed to the growth of evidence in the area.^{17–20}

In Saudi Arabia, IPE is relatively an emerging concept, and data is scarce regarding the number and nature of IPE courses implemented in Saudi universities. Among the first studies published were two studies that measured students' attitudes and readiness for IPE showing positive results.^{21,22} Both studies collected data using surveys, however, no details were reported regarding whether IPE courses were offered or not in their institutions.

To enhance the quality and reputation of healthcare programs, leaders in healthcare undergraduate programs at Taif University intend to seek accreditation from national and international accreditation bodies. To the best of our knowledge, no studies have measured students' readiness for IPE at Taif University. Thus, it is important to explore students' readiness for IPE to ensure good awareness of IPE before any implementation plans take place.

The Readiness for Interprofessional Learning Scale (RIPLS) is a validated self-reported questionnaire widely used to measure learners' attitudes and readiness for IPE.^{23–25} The original version was developed by Parsell and Bligh¹³ consisting of 19 questions covering four subscales: 1-teamwork and collaboration, 2-negative professional identity, 3-positive professional identity, and 4-roles and responsibilities.²⁵ The purpose of this study was to measure attitudes and readiness for IPE among healthcare students at Taif University using the RIPLS. Additionally, the study aimed to explore any differences in students' attitudes in relation to their healthcare program, year of study, and other related factors.

Methods

Undergraduate students in medicine, nursing and pharmacy were targeted in a cross-sectional study. The listed healthcare programmes offer bachelor's degree programs, which students can apply for after finishing high school. The years of study at Taif University are: 6 years for bachelor's degree in medicine and surgery, 5 years for bachelor's degree in nursing and 6 years for the Doctor of Pharmacy (Pharm D) program.

The research instrument used for data collection was the Readiness for Interprofessional Learning Scale (RIPLS) and was administered on-line. The tool includes closed-ended questions formatted in a 5-point Likert scale format (from strongly agree = 5 to strongly disagree = 1), with a maximum score of 95 and a minimum of 19. High scores on the overall RIPLS mean students value shared learning highly and respect other professionals. While higher scores in subscale 4, roles and responsibilities, indicate distorted perceptions of one's own role and the roles of other professionals. It is worth noting that for the items 10, 11 and 12 under subscale 2, "Negative Professional Identity", scores are reversed when calculating the overall scores (eg, 5 = strongly disagree is converted to 1 = strongly agree).²⁵

The RIPLS version used in this study was the adapted version of RIPLS used by Latrobe Community Health Service & the Health & Social care Interprofessional Network (HSIN).²⁶ A section on demographics, including gender, major, and year of study, was added to the tool to collect data about the participants. A pilot study used the online questionnaire to test the feasibility and applicability of the instrument among five students from different healthcare programs at Taif University. All students reported no issues and found the questionnaire clear.

The main study used convenience sampling technique for the selection of respondents based on the following criteria:

- a. Undergraduate students (male or female) at Taif University.
- b. Advanced years of study, 3rd year and above, from the following programs: pharmacy, medicine, and nursing.

Students from programs other than the three outlined above, and postgraduate students were excluded. Students from targeted programs were recruited through WhatsApp groups (common among students). Invitations to the study with a link to the questionnaire were sent through WhatsApp application. A reminder was sent via the same application after one month to recruit more students. Additionally, an Email was sent to some of the academic staff from the targeted programs and they were asked to help with recruitment for the study by sharing the invitation with their students via email. All participants signed informed consent.

As the population for this study was under a thousand, a minimum ratio of 30% is advisable to ensure an adequate representation of the sample.²⁷ The population of targeted participants was about 860. Consequently, a representative sample should not be fewer than 258 participants.

Data were analyzed using IBM SPSS statistics, version 25. Demographic characteristics were presented in frequencies and percentages. Mean and standard deviation (SD) were also used to present the data. Analysis of variance (ANOVA) with post-hoc analysis was used to analyze the association of the program of study and year of study with the student's readiness for IPE. An independent sample *t*-test was used for the bivariable analysis of the outcomes and the following factors: gender, clinical training experience, and attending previous IPE sessions. Multiple regression analysis was used to identify the association of demographic factors with overall RIPLS and sub-scale scores. A *p*-value of 0.05 or less was considered statistically significant. In ANOVA, the *F* value was used to compare the variance between group means to the variance within groups to provide a measure of whether the differences between group means are statistically significant with a real effect on the data. A significant *F* value indicates that at least one group mean differs significantly from the others, warranting further post-hoc analysis to identify the specific group differences.

Cronbach's Alpha test was used to identify the reliability and internal consistency of the RIPLS tool used in this study's sample. The test showed a highly reliable coefficient (> 0.8) for all subscales and the overall RIPLS, except the roles and responsibilities subscale (coefficient $\alpha = 0.31$).

Results

The questionnaire was conducted from January 2024 to March 2024. The study encompassed a diverse group of 263 healthcare students. All participants completed the questionnaire, and their data was included in the analysis.

The sample had a predominant representation of females (68.8%), significantly outnumbering males who made up 31.2% of the sample. In terms of the nature of the program, most of the students were from pharmacy (55.1%), followed by nursing and medicine, which constituted 25.1% and 19.8% respectively. The distribution across academic years showed a relatively even spread with the largest groups being fourth-year students (29.3%), followed by third and fifth-year students (Table 1). Sixth-year students were the least represented, making up only 15.6% of the participants. Regarding clinical training, more than half of the participants (58.9%) reported having some form of clinical training experience. Participation in previous IPE sessions was relatively low, with only 16.7% of students reporting attending previous IPE sessions.

The overall RIPLS score for all students was 76.58, with a standard deviation of 9.53, indicating a positive inclination towards IPE (Table 2). The comparison of the means and standard deviation (SD) of all statements shows that students mostly agreed/strongly agreed with statements under the teamwork and collaboration sub-scale. The statement with the highest average rating was "For small group learning to work, students need to respect and trust each other", (mean = 4.48, SD = 0.76), indicating strong agreement. This was followed by statement no 3: "Shared learning with other

Table 1 Demographic Characteristics of Participants (n=263)

Variable		Frequency	%
Gender	Male	82	31.2
	Female	181	68.8
Program of study	Medicine	52	19.8
	Pharmacy	145	55.1
	Nursing	66	25.1
Year of study	Third year	72	27.3
	Fourth year	77	29.3
	Fifth year	73	27.8
	Sixth year	41	15.6
Clinical training experience	Yes	155	58.9
	No	108	41.1
Had attended an IPE session	Yes	44	16.7
	No	219	83.3

Abbreviation: IPE, Interprofessional education.

Table 2 Participants' Responses for the Items of the RIPLS (n=263)

	Statement	Mean	Standard Deviation SD
Subscale 1: Teamwork & Collaboration			
1	Learning with other students will make me more effective member of a healthcare team	4.29	0.82
2	Patients would ultimately benefit if healthcare students worked together	4.37	0.78
3	Shared learning with other healthcare students will increase my ability to understand clinical problems	4.44	0.77
4	Communications skills should be learned with other healthcare students	4.37	0.78
5	Team-working skills are vital for all healthcare students to learn	4.40	0.79
6	Shared learning will help me to understand my own professional limitations	4.30	0.80
7	Learning between healthcare students before qualification (pre-license) would improve working relationships after qualification	4.27	0.82
8	Shared learning will help me think positively about other healthcare professionals	4.23	0.87
9	For small group learning to work, students need to respect and trust each other	4.48	0.76
Subscale 2: Negative professional identity			
10	I do not want to waste my time learning with other healthcare students	3.25	1.30
11	It is not necessary for undergraduate healthcare students to learn together	3.27	1.33
12	Clinical problem solving can only be learned effectively with students from my own school	3.12	1.28

(Continued)

Table 2 (Continued).

	Statement	Mean	Standard Deviation SD
Subscale 3: Positive professional identity			
13	Shared learning with other healthcare professionals will help me to communicate better with patients and other professionals	4.21	0.89
14	I would welcome the opportunity to work on small group projects with other healthcare students	4.11	0.95
15	I would welcome the opportunity to share some generic lectures and tutorials with other healthcare students	4.24	0.77
16	Shared learning will help to clarify the nature of patients and clients problems	4.18	0.88
17	Shared learning before qualification will help me become a better team worker	4.27	0.85
Subscale 4: Roles & responsibilities			
18	I am not sure what my professional role will be	2.99	1.24
19	I have to acquire much more knowledge and skills than other students in my own faculty	3.78	0.99

Abbreviation: RIPLS, readiness for interprofessional learning scale.

healthcare students will increase my ability to understand clinical problems” (mean= 4.44, SD= 0.77), statement no 5: “Teamwork skills are vital for all healthcare students to learn” (mean= 4.40, SD= 0.79), and statement no 2: “Patients would ultimately benefit if healthcare students worked together” (mean= 4.37, SD= 0.78).

Conversely, statements related to skepticism or reluctance towards IPE received lower scores. For instance, “Clinical problem solving can only be learned effectively with students from my own school” and “I do not want to waste my time learning with other healthcare students” scored the lowest, with means of 3.12 and 3.25, respectively. The least-rated statement was related to the roles and responsibilities subscale, “I am not sure what my professional role will be” (mean= 2.99, SD= 1.24).

Table 3 shows a comparison of the subscale responses based on the program of study. Nursing students displayed the highest readiness with a mean of 77.59 (SD=8.32), suggesting a stronger appreciation or acknowledgment of the benefits of IPE within this group. Followed by pharmacy students (mean= 74.88, SD= 9.43), and the least was reported by medical students (mean= 73.56, SD= 10.47). The statistical analysis showed that the program of study significantly impacted the overall RIPLS scores ($F = 4.68$, $P = 0.01$).

The post-hoc analysis showed a significant difference between nursing and medicine in the overall RIPLS scores and two of the subscales (Table 4). No significant difference was found between nursing and pharmacy, nor pharmacy and medicine.

Table 3 Comparison of Overall RIPLS and Subscale Scores Based on Students' Program of Study (n=263)

RIPLS Subscales	Possible Minimum-Maximum Scores	All students Mean (SD) (n=263)	Medicine Mean (SD) N=52	Pharmacy Mean (SD) N=145	Nursing Mean (SD) N=66	F	P value
Overall RIPLS	33–95	76.58 (9.53)	73.48 (10.08)	76.68 (9.85)	78.80 (7.64)	4.68	0.01*
Teamwork & collaboration	9–45	39.15 (5.30)	37.63 (5.91)	39.10 (5.36)	40.45 (4.30)	4.23	0.02*
Negative professional identity	3–15	9.64 (3.37)	8.96 (3.11)	9.90 (3.37)	9.61 (3.53)	1.51	0.22

(Continued)

Table 3 (Continued).

RIPLS Subscales	Possible Minimum-Maximum Scores	All students Mean (SD) (n=263)	Medicine Mean (SD) N=52	Pharmacy Mean (SD) N=145	Nursing Mean (SD) N=66	F	P value
Positive professional identity	5–25	21.02 (3.55)	20.02 (4.08)	21.08 (3.55)	21.65 (2.89)	3.19	0.04*
Roles & responsibilities	2–10	6.77 (1.73)	6.87 (1.82)	6.59 (1.67)	7.09 (1.74)	1.99	0.14

Notes: *P value ≤ 0.05 was regarded as statistically significant.

Table 4 Post-Hoc Analysis of the Significant Difference Between Groups in the Overall RIPLS Score, Teamwork and Collaboration, and Positive Professional Identity Sub-Scales. (n=118)

Groups	Difference in Means	Confidence Interval	P value
Overall RIPLS Medicine-Nursing	-5.32	-9.52 to -1.12	0.01*
Teamwork & collaboration Medicine-Nursing	-2.82	-5.16 to -0.48	0.01*
Positive professional identity Medicine-Nursing	-1.63	-3.2 to -0.06	0.04*

Notes: *P value ≤ 0.05 was regarded as statistically significant.

Nursing students had the highest rate for statements related to the teamwork and collaboration subscale (mean= 40.45, SD = 4.30), followed by pharmacy students (mean= 39.10, SD = 5.36) (Table 3). Meanwhile, pharmacy students highly supported statements related to negative professional identity (mean = 9.90, SD = 3.37). While nursing students had the highest mean for the positive professional identity subscale compared with other groups (mean = 21.65, SD = 2.89). They also had higher scores for roles and responsibilities (mean = 7.09, SD = 1.74). The analysis showed that the program of study significantly impacted the teamwork and collaboration subscale ($F= 4.23$, $P= 0.02$), and the positive professional identity subscale ($F= 3.19$, $P= 0.04$). No significant difference existed between the programs on the other subscales ($P > 0.05$).

The bivariate analysis of the overall RIPLS scores in relation to other factors (gender, clinical experience, attending previous IPE sessions and the year of study), showed no significant difference (Table 5). With regards to the roles and responsibilities subscale, there was a significant difference at $p= 0.04$ in relation to the year of study. Also, a significant difference was found in the association between negative professional identity and attending previous IPE sessions.

Discussion

This study utilized the RIPLS questionnaire to assess attitudes and readiness towards IPE among healthcare students from various programs at Taif University. Findings of this study highlighted the positive inclination of students towards IPE, with notable enthusiasm particularly among nursing students. Analysis of RIPLS scores in relation to factors such as program of study, gender, year of study, attending IPE sessions and clinical training experience provided insights into what might influence healthcare students' readiness for IPE.

Findings of this study showed positive attitudes towards IPE and high readiness for IPE among healthcare students with high overall RIPLS scores. This suggests that students recognize the importance of mutual respect between learners from different programs and value the opportunities of shared learning environments. Evidence shows that effective interprofessional collaboration can be influenced by healthcare professionals' attitudes towards others and by knowledge

Table 5 Comparison of Overall RIPLS and Subscale Scores Based on Other Students' Characteristics (n=263)

Item	Gender			Clinical Training Experience			Had Attended an IPE Session			Year of Study		
	t	P value	Cohen's d	t	P value	Cohen's d	t	P value	Cohen's d	F	P value	η^2
RIPLS overall score	-1.88	0.06	0.25 ^a	-1.33	0.18	0.18 ^b	0.84	0.40	0.14 ^b	2.47	0.06	0.03 ^b
Teamwork & collaboration	-1.67	0.09	0.22 ^a	-1.43	0.15	0.16 ^b	0.43	0.67	0.07 ^b	1.61	0.19	0.02 ^b
Negative professional identity	-0.82	0.41	0.11 ^b	-1.36	0.18	0.17 ^b	1.94	0.05*	0.32 ^a	1.75	0.16	0.02 ^b
Positive professional identity	-1.36	0.17	0.18 ^b	-0.31	0.76	0.04 ^b	0.64	0.53	0.11 ^b	2.10	0.10	0.02 ^b
Roles & responsibilities	-0.79	0.43	0.10 ^b	0.34	0.74	0.04 ^b	-1.73	0.08	0.28 ^a	2.86	0.04*	0.03 ^b

Notes: *P value ≤ 0.05 was regarded as statistically significant. ^a indicates small to medium effect size, ^b indicates small effect size.

about their own roles and the others' roles.^{28,29} Based on accumulative evidence, IPE can positively influence learners' attitudes towards other professions and help them gain collaborative competencies.^{9,10,23,30}

The overall RIPLS score, 76.58, reported in this study is quite similar to studies conducted in Saudi Arabia.^{24,31,32} Higher scores, 80.6, were reported by Almazrou and Alaujan, where students had an IPE session which likely influenced the students' response positively justifying such high scores.³³ Such high scores were reported in similar studies, in which students' scores for RIPLS increased significantly after attending an IPE session.^{20,34}

Nursing students in this study scored higher in overall RIPLS scores, team and collaboration and positive professional identity subscales, which is consistent with previous studies where nursing students showed higher appreciation for IPE.^{24,35} The significant difference found in RIPLS scores in relation to the program of study was also shown in previous studies.^{22,31,36} However, the program that scored the highest was different for each study based on the included programs.

In this study, medical students scored significantly lower than nursing students. Several factors might contribute to the differences across the programs in their readiness for IPE including scope of study, curriculum design, and the inherent nature of professional roles (El-Awaisi & Barr, 2017). Additional factors could be social influence and how society appreciates some professions over others. For example, due to the historical nature of hierarchies in healthcare systems, physicians usually are assigned to leadership positions, which could influence how medical students and physicians perceive their own roles.³⁷ Some authors suggested offering pre-introductory sessions to introduce the IPE concept to healthcare students and widen their understanding of its purpose, the nature of the sessions and the professions that can be involved.¹⁴ Such introductory sessions could be useful to address the variety found in readiness for IPE across the programs.

Nursing students scored higher on the roles and responsibilities subscale, which indicates that nursing students might have unclear or distorted perceptions about their professional role in the future. IPE sessions designed deliberately to show the boundaries between different roles and how every professional can contribute to MDT could be beneficial in addressing this issue.

Regarding the year of study, it did not significantly influence RIPLS scores in our study, which can be justified by the inclusion criteria as only students from advanced years were included. This finding was inconsistent with previous studies by Al-Qahtani and Alruwaili et al, where the year of study significantly influenced students' readiness for IPE.^{22,36} Authors explained that as healthcare students progress in their education, their perceptions and readiness for interprofessional learning evolve and their understanding of their own professional roles progresses. Nufaiei et al, stated that as students progress through their educational programs, they gain more clinical experience and exposure to interprofessional settings, which likely enhances their readiness and understanding of collaborative practice.³⁸

With respect to other factors including gender, clinical training experience, and attending previous IPE sessions, there was no significant difference in students' attitudes towards IPE. Although some data reported female sex as a significant factor linked to higher RIPLS scores,²⁹ gender influence did not reach statistical significance. This finding resonates with recent studies.^{22,36} This could be attributed to developments in higher education and health education in particular, where the universal nature of professional values and educational experiences has become similar across genders within the same educational settings.³⁹

Our findings showed that having attended an IPE session was not significant when compared with the overall scores, which contradicts a previous study that showed attending previous IPE sessions was of a significant influence.³³ In this study, although some students reported attending IPE sessions, this should be interpreted cautiously because to the best of authors' knowledge, IPE in its formal definition has not been implemented at Taif University at the time of conducting this study or before.

With respect to the implications of this study, faculty leaders and educators across Taif University can use our findings to assess opportunities and start strategic planning for IPE implementation within the university. Our findings also build upon existing published data within Saudi Arabia, which hopefully will encourage regional and national collaborations to share best practices and develop creative strategies for enhancing IPE implementation across different educational contexts.

Further studies using qualitative approaches can explore why certain factors were more influential and how students perceive IPE. By addressing influential factors in more depth, healthcare educators at Taif University, and other Saudi universities with similar contexts, can better prepare students for collaborative learning environments. Future research could also consider expanding the scope to include more healthcare programs to have more representative results. Also, educators' views about IPE are still to be explored, as they are among the relevant stakeholders who need to be on board before implementing IPE and to ensure their awareness and championing of IPE.

With respect to the limitations, this study relied solely on self-reporting by participants, which could be affected by social desirability and opinions were not objectively measured. As the findings were reported by students from Taif University, the representativeness of the findings in settings outside the university is uncertain. Finally, the recruitment strategy could inflate the results in favor for IPE as students who participated could have enthusiasm towards IPE.

Conclusion

The findings of this study revealed positive attitudes towards IPE among healthcare students at Taif University indicating appreciation of the value of IPE. Significant differences in readiness levels for IPE were found across the programs, which could be attributed to factors relating to the nature of study in each program and social factors. Suggestions for future studies include expanding the scope to include more healthcare programs and incorporating qualitative approaches to explore the reasons behind differences in readiness for IPE.

Ethics Statement

This study received ethical approval from the Ethics Committee at Taif University (HAO- 02-T-105, Application number 45-123).

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

The authors report no conflicts of interest in this work.

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