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Exploring the awareness, attitude, and inclination of healthcare students towards interprofessional education: A cross-sectional study in Saudi Arabia

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ABSTRACT

Background: Interprofessional education (IPE) is acknowledged to enhance understanding between professionals and to facilitate learning. Healthcare professionals may be better equipped to accept and esteem other healthcare professionals, if interprofessional education is incorporated into undergraduate curricula. The management of challenging patient issues may also significantly benefit from this. As a result, the current study examined interprofessional education in their institutions and students' knowledge of and attitudes toward it.

Methodology: We conducted a cross-sectional questionnaire-based study among students from a university in the southwest of Saudi Arabia, who were enrolled in courses in medical, pharmacy, nursing, dentistry, allied health, and public health. Following validation, the questionnaire included six questions to probe their knowledge, ten questions to gauge their attitude, and eleven questions to inquire about the growth and use of IPE in their institutions. Multiple regression and the Kruskal-Wallis test were used to examine the data.

Results: The survey involved 600 students, and 66.8% of the respondents were male. Less than one-third of students studying medicine replied to the survey, while students in the public health department had the lowest response rate. Compared to students in other programs, pharmacy students achieved a higher mean attitude score toward IPE ($P < 0.001$). Additionally, nursing and pharmacy students' mean IPE awareness scores were higher than those of medical students ($P < 0.001$). However, all program participants firmly agreed that integrating IPE into the curriculum was a good idea.

Conclusions: The study found that students of a few programs had awareness and a positive attitude toward interprofessional education. Nonetheless, all of them favored its inclusion in their curriculum. They also stressed the need to educate teaching faculty on interprofessional education, to develop skilled facilitators within their institutions.

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1. Introduction

Interprofessional education (IPE) is characterized by knowledge exchange between two or more professionals from separate but interrelated fields, resulting in an interdisciplinary learning process and, as a result, building teamwork (World Health Organization, 2010). It is well-acknowledged that IPE improves interprofessional understanding and collaboration (Hall et al., 2014). Therefore, this multidisciplinary approach can benefit

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patient care and reduce the total burden of healthcare expenditure (Lestari et al., 2018; Schot et al., 2020; Grace, 2021). Will et al. evaluated 21 studies and found that in almost 60%, patient satisfaction was attributed to interprofessional care with improved health outcomes (Will et al., 2019).

IPE is an educational strategy that allows healthcare students to learn and work together more efficiently (Bloomfield et al., 2021; Mei-Chi et al., 2022), thus improving the overall quality of healthcare (van Wyk and de Beer, 2017). To evolve productively, IPE must be extensively implemented in all healthcare professions (Baird et al., 2019). IPE programs are to achieve these goals and improve knowledge, abilities, and attitudes toward interdisciplinary learning, teaching, and teamwork (World Health Organization, 2010). IPE helps students, mainly undergraduate students, develop respect and accountability towards their peers, valuing the opinion of other healthcare professionals collaborating with them, which will ultimately benefit the patient (Horsburgh et al., 2001; Ponzer et al., 2004; House et al., 2022). This interdisciplinary professional interaction would be stimulated when undergraduate students become aware of its benefits and healthcare educators facilitate interprofessional learning. Interestingly, some studies reported enhanced patient care when physicians, dentists, nutritionists, and nurses interact (Manski et al., 2015; Tan et al., 2014).

Traditionally, healthcare professionals undergo training within their specialties with little or no interprofessional collaboration (Carlisle et al., 2004). However, a lack of proper communication within the healthcare system can result in professional misjudgments that affect patient care (Altin et al., 2014; Carney et al., 2019). A previous study has shown that healthcare professionals trained in mono-professional systems were not aware of the beneficial effects of interprofessional collaboration (Oandasan and Reeves, 2005). Furthermore, the constant development of new medical technologies and a continuous increase in knowledge of different specialties require young professionals to adapt and become familiar with them constantly (World Health Organisation, 2010).

IPE programs prepare students for interprofessional learning (Titzer et al., 2015; van Diggele et al., 2020). Previous research reports revealed the introduction of IPE into their healthcare academic program plan in the United Kingdom, the United States, Canada, Australia, and some parts of Europe (Kuziemyky and Reeves, 2012; Rotz et al., 2015; Phillips, 2016). However, many regions have not yet established IPE programs. The delay could be due to difficulties in fulfilling the requirements for introducing new courses, managing timetables, crowded students, and personnel coordination (Della Freeth, 2005).

To our knowledge, very few studies have reported the establishment of IPE programs in the Kingdom of Saudi Arabia (KSA). Different authors agree that it is vital to implement these programs in the KSA (Al-Shaikh et al., 2018; Arab, 2019). Al-Shaikh et al. observed a favorable response to interprofessional learning programs among medical and dental students from Princess Nourah bint Abdulrahman University in Saudi Arabia (Al-Shaikh et al., 2018). A study of medical, pharmacy, nursing, and applied medical students from King Abdelaziz University, Saudi Arabia, indicated that IPE programs could improve interprofessional collaborative learning, self-improvement, and interprofessional relationships (Awan et al., 2018).

Recent studies have reiterated the need to optimize teams and strategies for IPE training to meet the region's healthcare needs and address different clinical presentations of diseases. For example, Al Maini et al. reported that IPE could improve knowledge deficiencies on rheumatic and musculoskeletal disorders among young physicians (Al Maini et al., 2020). Etherington et al. indicated that interprofessional collaboration training between physicians, surgeons, and anaesthesiologists is critical to ensure patient safety

in the operating room (Etherington et al., 2019). Despite the importance of interprofessional education for healthcare professionals, its implementation is poor in most institutions. Therefore, the present study aimed to evaluate knowledge, attitudes, and practices regarding IPE and its implementation among the healthcare student community of Jazan University.

2. Methods

2.1. Study design

A descriptive cross-sectional web-based survey was carried out among healthcare students.

2.2. Setting

Students who pursued healthcare courses at Jazan University between January 2020 and April 2021 were surveyed. Jazan University is a state-sponsored institution in southwest Saudi Arabia offering several certified healthcare programs. The old and amended education regulations are used to operate most healthcare courses. IPE activities are carried out extracurricularly because IPE theory is not included in the curriculum under the old regulation. The students in the higher semesters are enrolled in the old curriculum, which does not include IPE as part of their coursework. In contrast, the new entrants into the healthcare course are enrolled in the new curriculum, which includes IPE in theory and practice. Due to this, they are urged to plan and participate in extracurricular IPE activities. Nevertheless, because academic timetables vary amongst programs, only a few students actively engage in these activities.

2.3. Target population

The target population was made up of students majoring in applied medical sciences, public health, nursing, medicine, dentistry, and pharmacy. The length of each of these programs varies from 4 to 6 years. We included students from their second year through their internship, leaving out students from other streams. We networked with the mentors and instructors of these programs to increase our outreach to students, and we asked them to share the survey web link with the students. Since participation was entirely voluntary, we used the nonprobability convenience sampling strategy.

The Raosoft sample size calculator calculated the sample size with an α -level of 0.05 to get a 95% confidence level and a 50% anticipated response distribution.

2.4. Instrument

Following a review of the pertinent literature and considering the goals, a questionnaire was created (Al-Shaikh et al., 2018; Awan et al., 2018; Reeves and Barr, 2016). Consultations with professionals from the academic domains of medicine, pharmacy, public health, and nursing enabled us to create the questionnaire. After the face and content validity had been established, the questionnaire was modified based on their ideas, allowing us to produce the final edition.

The Kaiser-Meyer-Olkin (KMO) and Bartlett's sphericity tests were first conducted to establish sampling adequacy and evaluate the correlation between items. A KMO value of 0.5 or higher denotes adequate sampling, further enabling factor analysis. Additionally, the data can be used for factor analysis if the Bartlett test results are significant ($P < 0.05$). Then, principal component analysis was undertaken and to ascertain the number of components,

Velicer’s minimal average partial test was also performed (Velicer, 1976). Cronbach’s Alpha is a metric used to evaluate the reliability of the instrument. If the result exceeds the threshold value of 0.7, the scale is reliable.

The questionnaire had four segments. The first segment had seven questions about their demographic details, six questions about awareness of IPE programs, ten questions about their attitude toward IPE, and 11 questions about the development and practice of IPE in their institution. The responses were on a 5-point Likert scale wherein the respondent could choose from ‘strongly disagree,’ ‘disagree,’ ‘neither agree nor disagree,’ ‘agree,’ and strongly agree.

A numerical value was assigned to individual responses, converting them into scores to obtain quantitative data. For example, in the attitude/knowledge section about IPE, if a respondent chose “strongly agree,” they would be assigned a value of 5 and a value of 1 for “strongly disagree.” On the other hand, for items reflecting a negative IPE characteristic, the coding was everted. Therefore, each student obtained a score, and the mean scores for each category were calculated.

2.5. Ethical approval

The Institutional Review Board of Jazan University approved the study. The approval number is REC41/1/1–089, dated 18/11/2019.

2.6. Data analysis

Data were downloaded as a Microsoft Excel file, cleaned, coded, and exported to SPSS to run statistical tests. Statistical analysis was then performed using multiple linear regression followed by the Kruskal-Wallis rank test to assess group differences. Demographic characteristics were considered the independent variable, and mean scores attained as the dependent variable. A P-value less than or equal to 0.05 is considered significant.

3. Results

Six hundred students responded to the survey, and 68 % were male. The highest response was obtained from medical students (28.8%), while the response from students who pursued the public health program was less (8.2 %) (Table 1).

The KMO values for the knowledge and attitude scale were 0.862 and 0.863, respectively. The knowledge and attitude scale showed significant results ($P < 0.001$) from the Bartlett test of sphericity (Table 2). The Cronbach Alpha for the knowledge and attitude domain was 0.89, and 0.84, respectively (Table 2).

Table 1
Demographic characteristics of our respondents.

Sample Characteristics	Groups	N (%)
Gender	Male	401 (66.8%)
	Female	199 (33.2%)
Discipline	Medical	173 (28.8%)
	Dental	134 (22.3%)
	Pharmacy	114 (19.0%)
	Nursing	58 (9.7%)
	Allied Health	72 (12.0%)
	Public Health	49 (8.2%)
Year of study	Second	59 (9.3)
	Third	124 (20.67)
	Fourth	294 (49)
	Fifth	123 (20.50)

Table 2
Assessment of sampling adequacy and reliability of the interprofessional education questionnaire.

	Knowledge domain	Attitude domain
Kaiser–Meyer–Olkin (KMO) test for sampling adequacy	0.862	0.863
Bartlett’s Test of Sphericity		
Approximate Chi square	1906.22	2679.60
DF	15	45
Significance	0.001	0.001
Cronbach’s alpha	0.89	0.84

According to the survey, 32 % agreed that teamwork could complicate issues, while 39 % felt that IPE training was time-consuming. However, 83 % of the students said that it would help them to communicate more effectively and understand the roles of other healthcare professionals (Fig. 1). Participants have a minimum attitude score of 23, a maximum score of 50, with a mean of 38.5 (standard error of the mean [SEM]: 5.2). The better the attitude towards IPE, the higher the score. The results indicated that the pharmacy and nursing students had a higher mean attitude score, while the allied health students had the lowest mean attitude score (Fig. 2).(See Fig. 3).

Evaluation of their understanding of IPE revealed that 75 % of the students felt it would help them establish collaborative skills and develop patient care plans (78 %). Comparatively, only 16 % of respondents disagreed that they were familiar with the concept of IPE, and 11 % were unaware that it would apply to students of all streams. Students revealed that IPE can promote team-based learning (68 %); however, 22 % gave an indifferent response (Fig 0.3). Depending on the response, the total score for the knowledge scale items ranged from 6 to 30, with a mean value of 23.13 (SEM: 4.6). The comparison revealed that nursing and pharmacy students had higher mean scores (Fig. 4).

Multiple regression examined the relationship between knowledge and attitude scores with student academic affiliation after adjusting for gender and study year. Pharmacy students have a significant and positive attitude towards IPE compared to medical students (β : 2.691; p value < 0.001). All other students in the health care courses showed a positive attitude towards IPE; however, the differences were not statistically significant. Additionally, dentistry students had a negative attitude towards IPE (Table 3).

The relationship between knowledge and academic affiliation was determined after adjusting for sex and the semester of study. When compared to medical students, the knowledge of IPE among pharmacy (β : 2.341; p value < 0.001) and nursing students (β : 2.441; p value < 0.01) was higher and statistically significant. The mean attitude or knowledge for gender was not statistically significant. Although there was no appreciable difference in understanding over the semesters, the fourth and fifth-semester students’ attitude about IPE was statistically better than those of the second-year students (Table 3). The Kruskal Wallis test revealed that there were differences among different fields that were statistically significant ($P < 0.001$) (Table 4).

Students answered further questions about the practice of IPE and the benefits related to its implementation (Table 5). It is interesting to note that more than 80 % of the students stated that they would want IPE in the curriculum, that they would find it helpful to engage with other healthcare professionals throughout their clinical training, and that going to IPE seminars with other professionals would be beneficial. Less than half, meanwhile, concurred that IPE was practiced in their college. The majority also concurred that training the teaching staff and changing the curriculum would be necessary to adopt IPE.

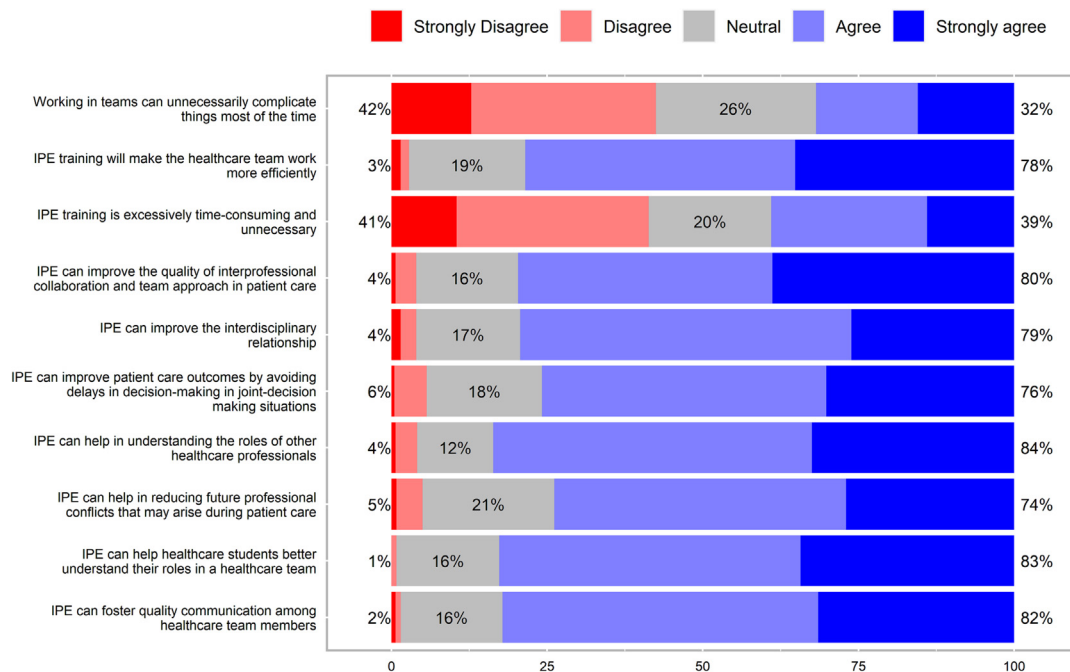


Fig. 1. Assessment of attitude of healthcare students towards interprofessional education.

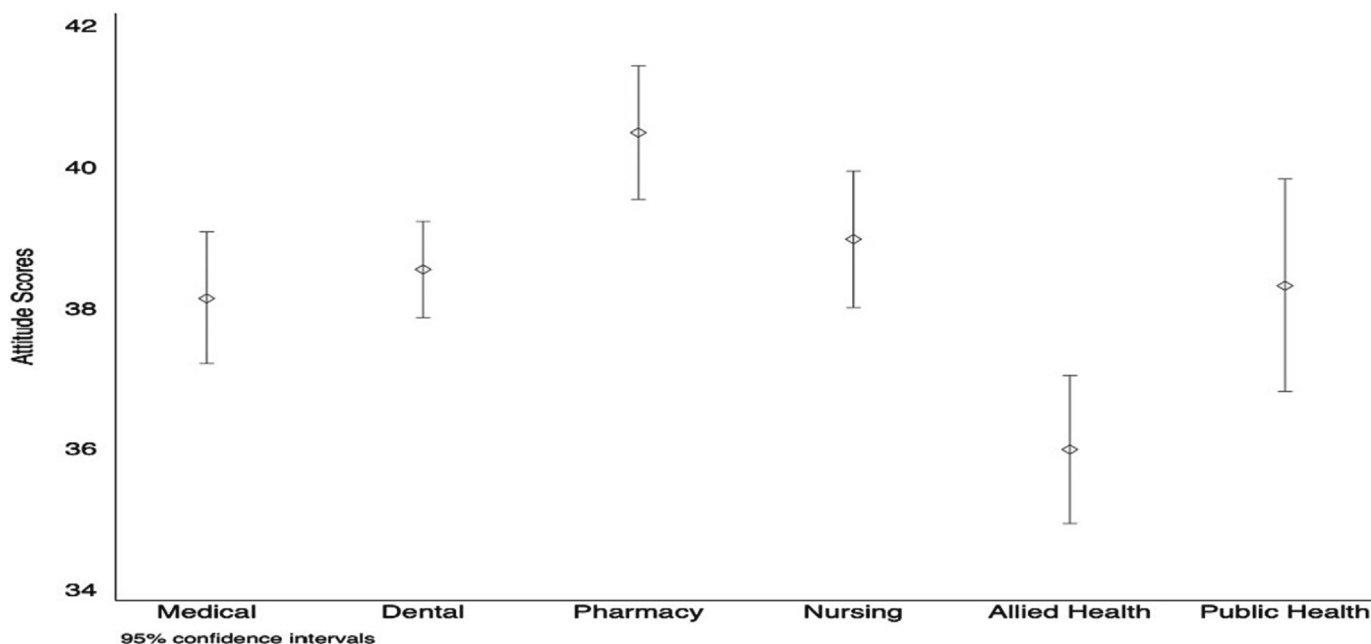


Fig. 2. Attitude scores of healthcare students towards interprofessional education.

4. Discussion

The present study explored students’ awareness, attitudes, and practice toward IPE, and we found that students from diverse healthcare programs differed in their awareness and attitude toward IPE.

Most respondents acknowledged that IPE could facilitate communication between healthcare providers, support a collaborative approach, and let professionals design the best course of action while providing patient care. In general, the students felt that IPE education and training could enhance the efficiency of healthcare teams without undermining each other’s strengths and could fos-

ter mutual respect. Intriguingly, only 16 % of our students were unfamiliar with the term IPE compared with 88.5% of South Korean healthcare students (Yune et al., 2020).

Closer introspection of the mean attitude scores attained by various healthcare students revealed that pharmacy students had a higher average score, indicating a better attitude toward IPE than the other streams. We believe that the better score might legitimately be attributed to hosting various events that may have promoted interactive learning, networking, and the development of professional relationships. Additionally, including IPE learning modules in the curriculum might have contributed to the response. Similarly, Vogler et al. found that pharmacy students view IPE

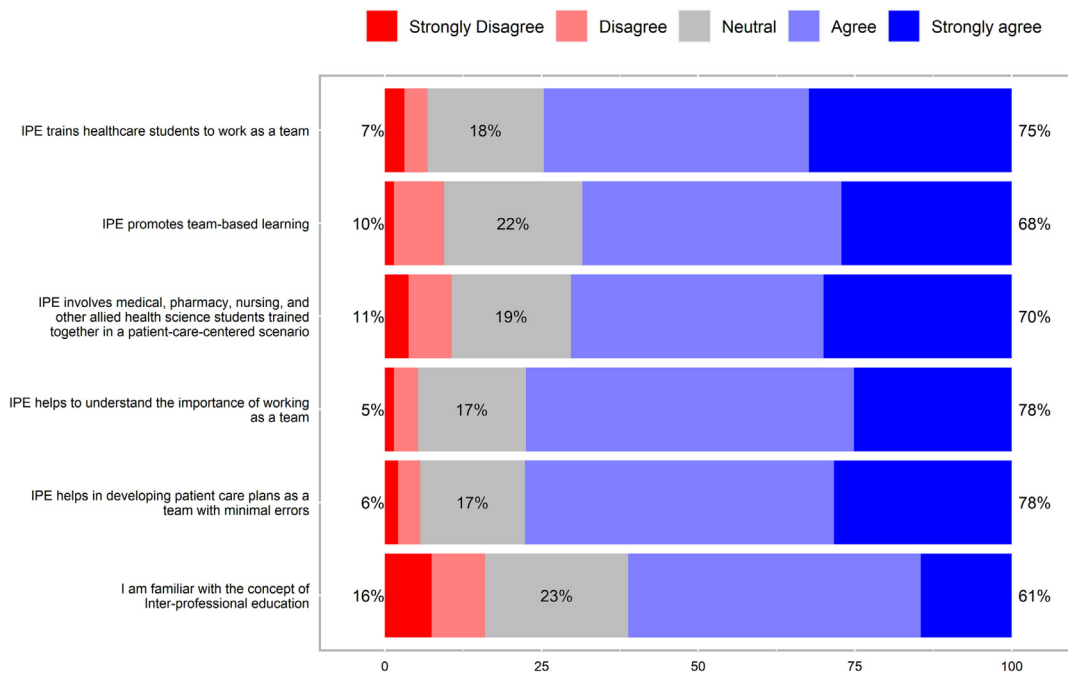


Fig. 3. Assessment of knowledge of interprofessional education among healthcare students.

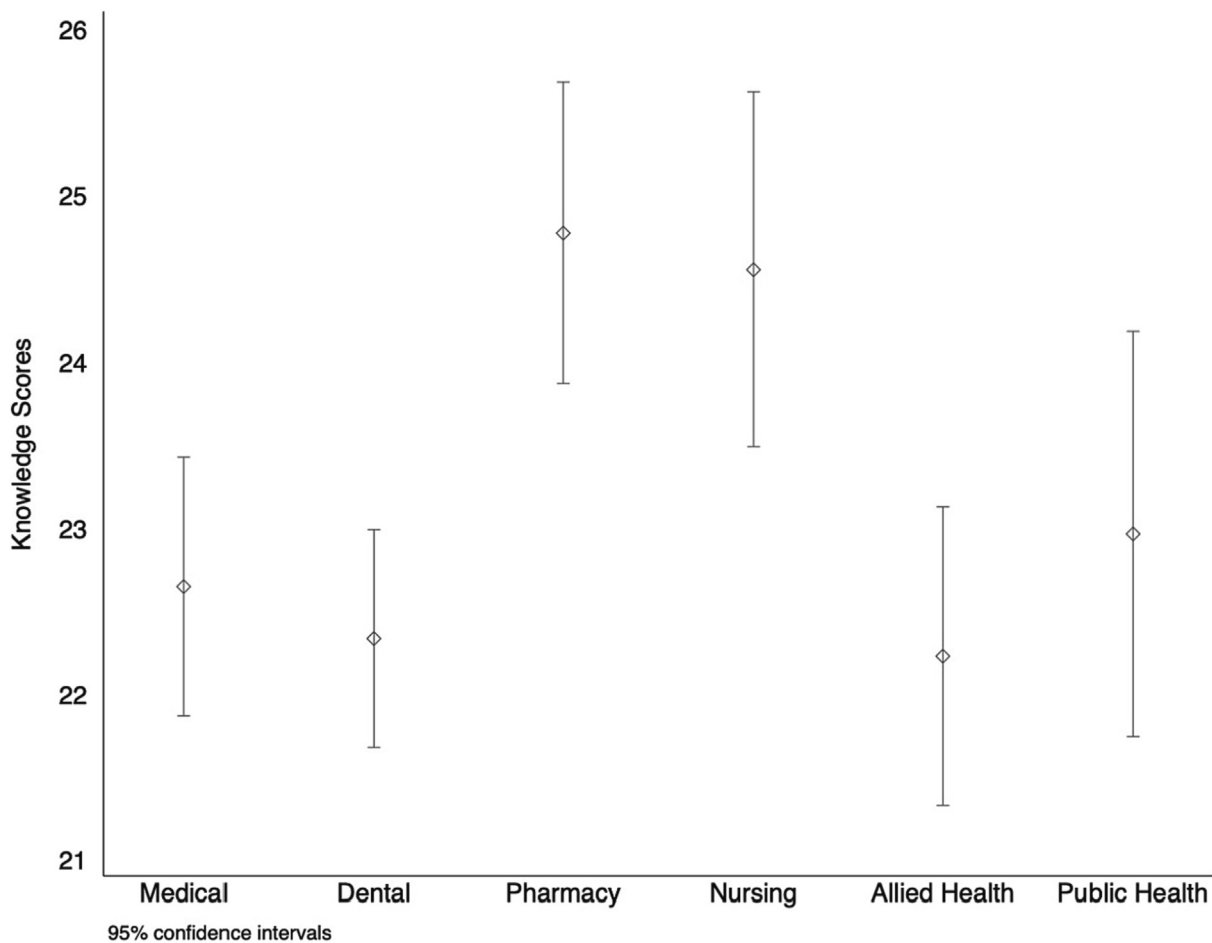


Fig. 4. Mean knowledge scores among students of various healthcare streams.

Table 3
Multiple regression analysis to predict students' attitude and knowledge towards interprofessional education.

Explanatory variable	Attitude			Knowledge			
	β	95 % CI	P-value	β	95 % CI	P-value	
Discipline	Medical	Reference					
	Dental	0.008	(-1.163– 1.178)	0.664	-0.299	(-1.361– 0.764)	0.581
	Pharmacy	2.691	(1.463– 3.92)	<0.001*	2.341	(1.226 – 3.457)	<0.001*
	Nursing	1.456	(-0.239– 3.151)	0.107	2.441	(0.902 – 3.98)	0.002*
	Allied Health	1.252	(-2.714– 0.209)	0.051	0.078	(-1.249– 1.405)	0.908
Gender	Public Health	1.545	(-0.171– 3.261)	0.109	0.972	(-0.585 – 2.53)	0.221
	Male	Reference					
Year of study	Female	0.439	(-0.539– 1.416)	0.49	-0.241	(-1.129– 0.646)	0.593
	Second	Reference					
	Third	0.825	(-0.757– 2.408)	0.306	-0.968	(-2.404 – 0.469)	0.186
	Fourth	3.229	(1.767– 4.69)	<0.001*	0.194	(-1.133 – 1.521)	0.774
	Fifth	3.026	(1.418– 4.635)	<0.001*	0.111	(-1.349 – 1.572)	0.881

*P < 0.05 considered statistically significant.

Table 4
Assessment of the attitude and knowledge about IPE versus the discipline of healthcare students.

Discipline#	Knowledge domain	P-value	Attitude domain	P-value
	Mean (SD)		Mean (SD)	
Medical	22.64(5.20)	< 0.001*	22.64(5.20)	<0.001*
Dental	22.33(3.84)		22.33(3.84)	
Pharmacy	24.77(4.88)		24.77(4.88)	
Nursing	24.55(4.01)		24.55(4.01)	
Allied Health	22.22(3.83)		22.22(3.83)	
Public Health	22.96(4.25)		22.96(4.25)	

*P < 0.05 considered statistically significant. #Kruskall Wallis test.

Table 5
Development and practice of students regarding interprofessional education.

Information	Yes (%)	No (%)
IPE is widely practiced in our department	285 (47.5%)	315 (52.5%)
IPE is practiced in my college	265 (44.2%)	335 (55.8%)
Students in my college can benefit from IPE and training	451 (75.2%)	149 (24.8%)
I would like to have IPE in the curriculum	494 (82.3%)	106 (17.7%)
It is practically feasible to implement IPE in my college with current facilities	421 (70.2%)	179 (29.8%)
Without altering requirements for current curriculum, it is difficult to implement IPE	431 (71.8%)	169 (28.2%)
Faculty members in my college may need additional training to implement IPE	496 (82.7%)	104 (17.3%)
IPE needs more support from our university and my college	485 (80.8)	115 (19.2%)
I would like to have review of cases in groups of students from different disciplines	500 (83.3)	100 (16.7%)
I would like to have clinical rotations with team of health care students	506 (84.3%)	94 (15.7%)
It will be interesting to have joint seminars or workshops on IPE themes	504 (84.0%)	96 (16.0%)

more favorably than medical students do while transitioning care (Vogler et al., 2017). Our findings are consistent with a recent study by D'Costa et al., which found pharmacy students exhibited a more favorable attitude toward IPE than students of other healthcare professions (D'Costa et al., 2022). Furthermore, a study by Aziz et al. on Malaysian students found that pharmacy and nursing students readily embrace IPE (Aziz et al., 2011).

Our findings are consistent with a study claiming that nursing students are more knowledgeable about IPE (Vafadar et al., 2015). Based on the poor attitude and knowledge scores attained by students pursuing medical, dental, and applied health courses, we attribute their diminished inclination to several factors, including a sense of hierarchy and an in-built medical dominance in the former (Thomas et al., 2021), or an overall dearth of IPE modules or events.

Attending IPE sessions, however, has benefitted students by enhancing cross-disciplinary teamwork amongst the medical, pharmacy, nursing, physical therapy, and occupational therapy streams (Eccott et al., 2012). Additionally, some research claims that undergraduate IPE courses allow pharmacy students to learn about teamwork and interprofessional activities (Graber et al.,

2019; Horvath et al., 2019). Unfortunately, about one-fourth of the students believed that IPE was pointless, and about one-third reaffirmed that working in teams could complicate issues. Many students may have had a negative attitude toward IPE since they were unsure of team dynamics and could not foresee its benefits in their future practice. Another study revealed a nearly identical response, with 34% of the students expressing a neutral opinion toward interprofessional teamwork (Rotz et al., 2016). Therefore, we firmly believe that tempering the curriculum with IPE is crucial in fostering a productive discourse between professions and eventually enhancing their value in practice.

Our study did not observe a significant difference in attitude and knowledge of IPE between males and females. Our findings concur with Ahmad et al., who reported the same (Ahmad et al., 2013). However, some studies have found that female students were inclined toward IPE with a favorable attitude toward it (Horsburgh et al., 2001; Curran et al., 2007; Coster et al., 2008; Wilhelmsson et al., 2011; Bigio et al., 2016). Fortunately, we did not find any discrepancies in knowledge or application of IPE between our students based on gender, showing that we are on track to instill a positive attitude toward each other's profession.

Although understanding of IPE remained consistent across study years, attitudes regarding IPE significantly changed, as students advanced in grade. Our results align with a Saudi study that revealed a similar response (Al-Eisa et al., 2016). This could also be attributed to the extracurricular events organized, which might have encouraged our students to see working in an interprofessional team beneficial.

Almost one-half of the students confirmed that IPE was not practiced in their department or college. Despite this, over three-quarters of the students desired to incorporate IPE into the curriculum. According to the students, it would be “interesting to have combined seminars or workshops on IPE,” “would like to have clinical rotations with teams of other health care students, and ”would want to examine cases in groups with students of diverse disciplines.” Our findings align with the report by Vafadar et al., who found that Iranian students demonstrated readiness toward IPE (Vafadar et al., 2015). Furthermore, students of all health professions have acknowledged the necessity to implement IPE (Irajpour and Alavi, 2012; Rose et al., 2009; Buring et al., 2009). The World Health Organisation claims that by integrating interprofessional education and practice into the curriculum, the workforce’s competency could be tremendously improved, eventually benefitting the patient (World Health Organization, 2010). To foster collaboration among healthcare professionals, the traditional learning siloes that was practiced with a monoprofessional approach needs revision. Keeping this in focus and based on the Vision 2030 of Saudi Arabia, our university’s curriculum has been restructured. IPE is introduced as part of the curriculum, and several clubs are established to promote interprofessional learning. A meta-analysis by Guraya et al. echoes a similar opinion about IPE programs positively impacting students’ attitudes, knowledge, and skills regarding interprofessional collaboration (Guraya and Barr, 2018).

Furthermore, when asked about the barriers to implementation, more than three-quarters of the respondents in our study agreed that IPE would need a curriculum revision, faculty training for IPE facilitation, and supportive administrative backing. According to a survey conducted in South Korea, 85.2% of professors in the healthcare field are not familiar with IPE (Yune et al., 2020). Therefore, the concern among our students about trained faculty and their readiness for effective implementation of IPE is not unique but has also been expressed by students from other regions. Similarly, Maeno et al. observed that medical students from a Japanese university perceived faculty shortage as the main obstacle (Maeno et al., 2019). In contrast, another study identified the presence of simulation, a clinical skills center, and an online learning platform as IPE facilitators (van Diggle et al., 2020). While considering this, the candid response we received from our students regarding the obstacles to its execution will enable us to create some practical and scalable solutions in our institutions. We would also try establishing a clinical skills center since our students felt that reviewing cases together would help them build a rapport. Therefore, we believe some elementary assessments must be made to successfully implement IPE in the curriculum. These include comprehending students’ current knowledge and attitude toward IPE, coordinating IPE activities with our program goals, fostering collaboration, and obtaining feedback from facilitators and students to determine whether IPE enhances student learning. In addition, most students emphasized that IPE needs the support of the university and college. As correctly pointed out, administrative assistance is required for faculty training, resource provision, and timing adjustments for IPE activities (Bogossian et al., 2023).

This study covered students from various healthcare programs, giving us an insight into how they perceived IPE. Furthermore, since we received responses from 600 students, it adequately addressed our research question and improved the power of the

study. However, they might be concerns about the study’s generalizability as it only included students from a single university. Also, the cross-sectional design elicits responses at one point in time; nevertheless, if it were conducted following a training session, the results would likely be more encouraging.

To advance their competence, healthcare professionals receive explicit education and training. Despite this, it would be advantageous to seek support and advice when making decisions in practice and while managing complex patient problems. Additionally, this would only be achievable if they promoted the attitude of inclusivity, understanding, and respect between different professions. To develop this, students must undergo formal and informal interprofessional education and training in the undergraduate program. Therefore, policymakers must incorporate IPE courses or modules into the curriculum to promote professional rapport, emphasizing on training and supporting student-led interprofessional clinics.

5. Conclusion

Most students were enthusiastic about including IPE in their curriculum because they perceived it could improve interprofessional collaboration and patient outcomes. Encouraging students to participate in various IPE activities can dispel the misconception that it is a waste of time and might cause workplace conflicts. To make IPE advantageous for students, policymakers must pay closer attention to faculty training and administrative support.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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