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## **Bridging The Academic-Professional Gap: Internship Preparation In A Saudi Health Sciences Institution**

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### **Abstract**

Higher education institutions aim to prepare students for employment, but a gap often exists between educational curricula and employers' needs. Internships can help bridge this gap, and many programs require students to complete one before graduation. The study assessed the impact of a two-months internship preparation program on 45 fourth-year students at a Saudi health sciences institution. Using a pretest-posttest control group design, students completed an on-line survey that assessed students' level of confidence and knowledge among two groups (control and experiment). Data analysis was performed using SPSS, including descriptive statistics and the Mann-Whitney U test. Pre-assessment indicated lower confidence in professional interviews

(41%) and CV writing (32%), despite high confidence in teamwork and ethics. Post-program, the percentage of students reporting sufficient knowledge to start the internship increased from 30% to 76%, and those with adequate skills rose from 46% to 85%. Similarly, median confidence scores for CV development and interview handling significantly improved from 3 to 4 ( $p < 0.001$ ). The control group showed no significant changes. Most students (64%) reported that their needs were met, and 97% recommended program continuation. The study's findings underscore the crucial role of such programs in equipping future health professionals with essential skills and competencies.

**Keywords:** health sciences institution, internship, preparation program, professional field

## Introduction

In today's increasingly competitive job market, internships have become critical for professional development, career planning, and a seamless transition into employment. Employers are prioritizing professional experience in hiring decisions (1–3), prompting students to engage in programs that cultivate job-relevant skills (4). Thus, internships serve as vital gateways, bridging the gap between academic theory and professional practice by providing a structured work experience under expert supervision (3,5).

Previous studies have consistently highlighted the importance of practical abilities in addition to theoretical knowledge for students to meet the demands of the current job market (6–9). Šimičević and Štetić explored the perceptions toward training programs and found that internships developed practical skills and strengthened students' resumes commendably (6). Losekoot et al. reported that internships cultivate technical and communication skills, employee

relations, and professionalism among students (9). Thus, internships are instrumental in narrowing the academic-professional gap and fostering students' employability skills for a smooth transition into the workplace.

Although the benefits of internships are recognized, research on internship programs in the Gulf Cooperation Council (GCC) countries and, specifically, Saudi Arabia, remains relatively limited (10,11). The few studies examining experiences among the GCC countries have reported positive experiences, underscoring the contribution of internships to students' professional development and career readiness. Jawabri (11) assessed the role of internship experiences for better career prospects among students in the United Arab Emirates (UAE). He found that internships contributed to developing hard and soft skills vital for career success. Similarly, research across Saudi Arabia and other GCC nations emphasized that discipline-specific knowledge alone is insufficient for professional success (12–14). Notably, Griffin and Coelho (13) revealed UAE students' deficits in non-technical skills like critical thinking and self-management, suggesting a specific need for targeted preparation programs in the regional context. Furthermore, Oman by Al-Abri et al. (15) highlighted positive perceptions of the students regarding the impact of internships on teamwork, communication, and career development, further emphasizing the value of well-structured experiential learning in the GCC.

The extant literature (6–9) reports the positive benefits of internships, providing a foundation for our study focused on the development and impact of a specific internship preparation program tailored to the unique needs of health sciences students in a Saudi Arabian institution. By evaluating the effectiveness of this program in enhancing essential professional competencies and skills, the present study aims to provide insights into a proactive approach to bridging the academia-professional gap in the Saudi healthcare sector, building upon the

established benefits of internships and addressing the potential skill gaps identified in previous studies. Furthermore, the study addresses the gap in the literature on internship programs in the GCC region with respect to the importance of equipping students with essential professional competencies and skill demands of the evolving market. The extant literature has focused on examining internship programs while overlooking students' preparation before starting their internships. Also, this study focused on health sciences students who have been overlooked in previous studies. Furthermore, senior-level students' experiences with an internship preparation program in preparing and assisting them in the transition from being students to professionals in the workplace have been examined. Specifically, the study examined the level of confidence and knowledge of fourth-year students who were about to start the internship program.

### **Theoretical framework**

This study used Schlossberg's transition theory (16) as a framework to understand the experiences of fourth-year health sciences students as they prepare for and begin their internships. Schlossberg defines a transition as an event that results in changed relationships, routines, assumptions, and roles. The internship represents such a transition, requiring students to adapt to new professional settings, assume new responsibilities, and interact with diverse healthcare professionals. This study explored how an internship preparation program can facilitate this transition. Schlossberg's theory posits that individuals' ability to navigate a transition is influenced by several factors, categorized as the 4 Ss: situation, self, support, and strategies. The study's focus is aligned with the "self" and "support" aspects of this framework. Firstly, the study assessed the students' level of confidence and knowledge before and after the internship preparation program, as these are the key components of the "self" in Schlossberg's model, reflecting an individual's

resources for coping with a transition. Secondly, the study captures students' feedback regarding the internship preparation program. This feedback provides valuable insights into the "support" provided to students during this transition, although the program is designed to offer support by equipping students with the necessary skills and knowledge. Students' feedback also helps determine the effectiveness of this support and identify areas for improvement. In essence, the study uses the transition theory to frame the internship as a significant transition for students and to investigate how a targeted intervention can support them in successfully navigating this change.

### **Research aims and significance**

While the consensus in the literature supports the value of internships and preparatory programs, our study offers a nuanced perspective by providing specific evidence of the effectiveness of a tailored program within Saudi health sciences institutions. This context-specific finding contributes valuable insights to the existing body of knowledge, where research within the GCC is still evolving (10,11). Moreover, the observed improvement in students' confidence and knowledge in the assessed domains adds to the literature on the specific skills that can be cultivated through structured pre-internship training. This study addresses a critical gap between market needs and the output of higher education institutions. Despite substantial investments and policy reforms by the GCC governments, the region still lags behind developed countries concerning local employment rates (17). While a significant proportion of young individuals are entering the job market, the unemployment rate among the youth aged 15 and 24 years is > 12% (18), thereby indicating a notable disconnect between the current education system and the professional skills demanded by employers; this gap is likely to widen if unaddressed (4,19). Internship training can bridge this divide effectively, particularly during periods of significant transformation, such as the

ongoing changes in Saudi Arabia's public health education system. Aligned with Vision 2030, the transformation of Saudi Arabia's health sector is one of the most ambitious healthcare reforms in recent decades. Given these rapid changes, it is essential to equip students with the knowledge and skills to meet the evolving needs of the health sector. Thus, an internship preparation program was developed for and implemented among fourth-year students at a health sciences institution in Saudi Arabia. The present study assessed students' preparedness for and feedback on the internship preparation program. The two specific aims of the study were as follows:

- To assess fourth-year students' level of confidence and knowledge before and after attending the internship preparation program.
- To capture students' feedback regarding the internship preparation program.

## **Methods**

A cross-sectional study was employed to assess the fourth-year students' level of confidence and knowledge before and after attending the internship preparation program. The study employed a pretest-posttest control group (20).

## **Setting**

The study was conducted in a health sciences institution in Saudi Arabia. The institution hosted a variety of undergraduate and graduate programs. As a part of undergraduate study (bachelor's degree), students complete four years of coursework and a one-year mandatory internship during which they train at different sites in relevant sectors such as hospitals, governmental entities, and companies.

The institution provided a comprehensive internship preparation program specifically designed for fourth-year students in the academic term immediately preceding their internship placement. This program was delivered through a structured series of engaging workshops and interactive talks to equip students with the essential knowledge, skills, and professional insights necessary for a smooth and successful transition into a professional workplace setting. Typically held weekly, the total of 10 sessions covered a range of critical topics designed to enhance students' professional readiness. A key feature of the program is the strategic invitation of professional experts from various relevant industries and sectors who share their direct experiences, practical expertise, and valuable recommendations on navigating the professional landscape.

The internship preparation program was developed through domains reflecting the graduates' attributes. Each domain was addressed by delivering a set of sessions. Table 1 illustrates this alignment, demonstrating how each program domain directly addresses the graduates' attributes. For example, the graduate attribute of "digital and information technology abilities" informed the inclusion of "technical skills" as one of the domains delivered through training on MS Excel. Similarly, the emphasis on "commitment to values, ethics, and responsibility" led to incorporating "transition effectively to the workplace" to ensure students are professional, practical, and uphold ethics. The deliberate mapping ensured that the internship preparation program directly contributes to developing the institution's desired graduate competencies.

### **Data collection**

Data were collected from two groups: control and experimental. The experimental group comprised fourth-year students who attended the internship preparation program. They were

requested to respond to an online survey before attending the first session of the internship preparation program and again after the last session. The internship preparation program was delivered over two months.

The control group was selected using a pretest-posttest design. It included the enrolled fourth-year students (same level), but those who did not attend the internship preparation program (intervention). The inclusion criteria were being a fourth-year student and enrolled in any bachelor's degree program at the health sciences institution. The exclusion criterion was students from other levels at the institution. By selecting a control group of students at the same level who did not experience the intervention, the study asserted that the intervention effectuated the change (20). The same survey was administered to the control group consisting of students at the same level who did not attend the internship preparation program. We assessed their confidence and knowledge levels on two occasions, employing a time interval similar to that used in the primary data collection (two-month interval).

The sample size for this study was determined based on comparable previous studies targeting students in health disciplines, which successfully demonstrated significant effects with similar sample sizes (19,21,22). Furthermore, the data collection for the present study involved almost the entire targeted population of fourth-year students expected to start their internship program. The survey response rate for the control group was 100% at both pre- and post-assessment. For the experimental group, the response rates were 100% at pre-assessment and 92% at post-assessment. The slight difference in the sample size between the pre- and post-assessment was primarily due to participant attrition. Thus, the obtained sample size is justified as it represents a substantial portion of the targeted fourth-year student population. Combined with the high

response rates, this approach collectively provides a highly accurate description and enhanced precision of estimates within this specific cohort of the present study (23,24).

### **Instrument**

An anonymous online survey was created using QuestionPro and administered to the two groups. The survey used a five-point Likert scale ranging from strongly agree to strongly disagree. It included 19 statements reflecting different relevant domains, and students were asked to rate their level of agreement with each statement that reflected the level of area-related confidence and knowledge essential for internship students. The post survey included an additional section wherein students were asked to assess elements of the internship preparation program (organization, structure, timing...). Each statement mirrored both the institution's graduates' attributes and the key domains delivered through the internship preparation program, as shown in Table 1. The domains assessed in this study and delivered through the internship preparation program were intentionally selected to align with the institution's graduates' attributes.

**Table 1. Internship preparation program key domains**

<b>Domains</b>	<b>Topics</b>	<b>Graduates' attributes</b>
Program internship orientation	Program orientation	Digital & information technology abilities
	Interns & alumni focus group – seminar	
Technical skills	MS Excel	Active personality skills
Creating your professional image	Building resumes	
	Excelling in interviews	
	Networking	Commitment to values, ethics & responsibility
	Skills showcase	

Transition effectively to the workplace	Professionalism	
	Navigating the work environment	
	Practicing ethics	
	Professional certificates	

The survey's face and content validity were tested through review by three experts in the field (25). The reliability analysis indicated excellent internal consistency of the survey with the study sample (Cronbach's alpha = 0.92).

### Data analysis

A descriptive analysis was conducted to report students' assessments before and after the internship preparation program for the two groups. Responses of strongly agree and agree were grouped to reflect "positive responses." Likewise, strongly disagree and disagree responses were grouped to reflect "negative responses." Additionally, students' feedback on the program was reported descriptively. The Mann-Whitney U test was used to analyze the differences in the median scores of the two groups regarding each statement in the pre- and post-internship preparation program assessment. The non-parametric Mann-Whitney U test was applied to analyze ordinal data.  $p$ -value  $< 0.05$  was considered statistically significant. Data analysis was conducted using IBM Statistical Package for Social Sciences (SPSS) version 29.

### Results

In 2022, the internship preparation program was delivered to 45 fourth-year students who were expected to start their internship program by the end of the academic year. A total of 76 participants completed the survey at pre-assessment, with 37 in the experimental group and 39 in the control group. Post assessment, the experimental group had 34 participants, while the control

group consisted of 39 individuals. The slight difference in the sample size between pre- and post-assessment was due to respondents' attrition. The majority of the students were female and from the public health program, as shown in Table 2.

Both the experimental and control groups were predominantly female at both pre- and post-assessment. In the experimental group, 81% (n = 30) were female at pre-assessment and 82% (n = 28) at post-assessment, while 19% (n = 7) were males at pre-assessment and 18% (n = 6) at post-assessment. The control group had 85% females at both pre- (n = 33) and post-assessment (n = 33), and 15% (n = 6) males at both time points.

Participants were drawn from two programs: health information management and technology (HIMT) and public health (PH). In the experimental group, 32% (n = 12) were from the HIMT program and 68% (n = 25) from the PH program at pre-assessment. At post-assessment, the distribution was 21% (n = 7) HIMT and 79% (n = 27) PH. The control group had 51% (n = 20) HIMT and 49% (n = 19) PH at pre-assessment and 46% (n = 18) HIMT and 54% (n = 21) PH at post-assessment.

Table 3 presents students' assessment of their confidence and knowledge before and after attending the program. The pre-assessment positive responses were highest in students' ability to work effectively with teams and maintain ethical practice corresponding to 92% (n = 34), whereas the negative responses were highest in handling professional interviews 41% (n = 15) and writing curriculum vitae (CVs) and 32% (n = 12), respectively.

**Table 2. Participants' demographics**

Participants' demographics	Experimental group		Control group	
	Pre-assessment (N=37)	Post-assessment (N=34)	Pre-assessment (N= 39)	Post-assessment (N= 39)
<i>Gender – N (%)</i>				

Male	7 (19%)	6 (18%)	6 (15%)	6 (15%)
Female	30 (81%)	28 (82%)	33 (85%)	33 (85%)
<b><i>Program – N (%)</i></b>				
HIMT	12 (32%)	7 (21%)	20 (51%)	18 (46%)
PH	25 (68%)	27 (79%)	19 (49%)	21 (54%)

*Note: The HIMT program is a female only program – admits only female students.*

Overall, students' assessment of their confidence and knowledge improved after the program, as shown in Table 3. The program resulted in a measurable increase in the percentage of students who reported positive responses. The largest increase in positive responses was for handling interviews, with a 58% (n = 19) increase in post-assessment, whereas negative responses decreased for all statements, with several receiving no negative responses.

Notably, in the pre-assessment and across both programs, all female participants reported neutral to positive responses, with no negative responses, regarding their ability to work with teams and practice ethics in the workplace. Similarly, male students did not report any negative responses in their overall confidence and feelings of preparedness to start the internship. On the other hand, in the post-assessment, male participants provided positive responses regarding having the knowledge and required skills and feeling well-prepared and confident to start their internships, along with HIMT students, who reported positive responses in having the required skills to start their internships. Interestingly, positive responses were more pronounced among HIMT than PH students in terms of relationships and time management, effective communication, critical thinking, problem-solving skills, professionalism, and ethics.

**Table 3. Students' assessment pre and post the internship preparation program**

Confidence/knowledge statement	Experiment group						Control group					
	Pre-assessment N=37			Post-assessment N=34			Pre-assessment N=39			Post-assessment N=39		
	Negative	Neutral	Positive	Negative	Neutral	Positive	Negative	Neutral	Positive	Negative	Neutral	Positive
I feel confident in developing my own professional CV as part of the internship requirements	12(32%)	11(30%)	14(38%)	1(3%)	9(26%)	24(71%)	2(5%)	16(41%)	21(54%)	5(13%)	9(23%)	25(64%)
I feel confident to handle professional interviews for my internship	15(41%)	15(41%)	7(19%)	3(9%)	5(15%)	26(76%)	3(8%)	17(44%)	19(49%)	5(13%)	11(28%)	23(59%)
I feel confident in practicing networking and building professional connections during my internship	6(16%)	12(32%)	19(51%)	1(3%)	3(9%)	30(88%)	4(10%)	11(28%)	24(62%)	4(10%)	9(23%)	26(67%)
I feel confident in practicing technical skills (e.g. data analysis) during my internship	7(19%)	11(30%)	19(51%)	0	8(24%)	26(76%)	4(10%)	13(33%)	22(56%)	5(13%)	9(23%)	25(64%)
I feel confident in my skills to manage and navigate the work environment during my internship	3(8%)	12(32%)	22(59%)	2(6%)	6(18%)	26(76%)	2(5%)	11(28%)	26(67%)	3(8%)	7(18%)	29(74%)
I feel confident in my ability to manage interactions	5(14%)	9(24%)	23(62%)	1(3%)	4(12%)	29(85%)	1(3%)	8(21%)	30(77%)	3(8%)	6(15%)	30(77%)

and relationships with different people during my internship												
I feel confident in my ability to deal effectively and professionally with work conflict and problems that might arise during my internship	4(11%)	14(38%)	19(51%)	0	7(21%)	27(79%)	1(3%)	10(26%)	28(72%)	1(3%)	14(36%)	24(62%)
I feel confident in my ability to communicate effectively and professionally, with others during my internship	1(3%)	5(14%)	31(84%)	0	1(3%)	33(97%)	2(5%)	8(21%)	29(74%)	1(3%)	6(15%)	32(82%)
I feel confident in my ability to manage time properly and efficiently during my internship	3(8%)	8(22%)	26(70%)	0	3(9%)	31(91%)	1(3%)	11(28%)	27(69%)	1(3%)	6(15%)	32(82%)
I feel confident in my ability to practice leadership skills during my internship	5(14%)	8(22%)	24(65%)	1(3%)	5(15%)	28(82%)	3(8%)	15(38%)	21(54%)	1(3%)	13(33%)	25(64%)
I feel confident in my ability to work cooperatively with teams during my internship	0	3(8%)	34(92%)	0	0	34(100%)	1(3%)	10(26%)	28(72%)	3(8%)	6(15%)	30(77%)
I feel confident in	2(5%)	9(24%)	26(70%)	0	4(12%)	30(88%)	1(3%)	12(31%)	26(67%)	3(8%)	11(28%)	25(64%)

my ability to exercise critical thinking skills during my internship												
I feel confident in my ability to employ problem-solving skills during my internship	4(11%)	12(32%)	21(57%)	0	1(3%)	33(97%)	2(5%)	11(28%)	26(67%)	1(3%)	12(31%)	26(67%)
I feel confident in my ability to maintain and practice a high-level of professionalism during my internship	2(5%)	5(14%)	30(81%)	0	3(9%)	31(91%)	0	10(26%)	29(74%)	3(8%)	8(21%)	28(72%)
I feel confident in my ability to practice ethics in the workplace and maintain ethical conduct during my internship	0	3(8%)	34(92%)	0	2(6%)	32(94%)	0	11(28%)	28(72%)	0	4(10%)	35(90%)
I have the required knowledge to start my internship	8(22%)	18(49%)	11(30%)	1(3%)	7(21%)	26(76%)	3(8%)	17(44%)	19(49%)	4(10%)	9(23%)	26(67%)
I have the required skills to start my internship	6(16%)	14(38%)	17(46%)	1(3%)	4(12%)	29(85%)	3(8%)	17(44%)	19(49%)	2(5%)	8(21%)	29(74%)
I feel well-prepared to start my internship	11(30%)	15(41%)	11(30%)	1(3%)	4(12%)	29(85%)	5(13%)	15(38%)	19(49%)	4(10%)	12(31%)	23(59%)
I feel confident to start my internship	3(8%)	15(41%)	19(51%)	0	3(9%)	31(91%)	4(10%)	15(38%)	20(51%)	4(10%)	8(21%)	27(69%)

*Note. Negative responses correspond to strongly disagree and disagree. Positive responses correspond to strongly agree and agree.*

The median scores of the assessment of students' confidence and knowledge before and after attending the internship preparation program are presented in Table 4. The difference in assessment pre- and post-program reflected significant improvement in most areas. A measurable increase in students' confidence and knowledge was demonstrated for all statements, even if the median did not change. Moreover, the changes in students' confidence in navigating work environment, effective communication, leadership skills, teamwork, professionalism, and ethics, were not significant.

**Table 4. Median assessment pre and post the internship preparation program**

Confidence/knowledge statement	Experiment group				Control group			
	Pre-assessment median N=37	Post-assessment median N=34	P-value	Effect size	Pre-assessment median N=39	Post-assessment median N=39	P-value	Effect size
I feel confident in developing my own professional CV as part of the internship requirements	3	4	<.001	-0.45	4	4	0.97	-0.01
I feel confident to handle professional interviews for my internship	3	4	<.001	-0.58	3	4	0.87	-0.02
I feel confident in practicing networking and building professional connections during my internship	4	4	<.001	-0.41	4	4	0.76	-0.02

I feel confident in practicing technical skills (e.g. data analysis) during my internship	4	4	<b>.01</b>	-0.33	4	4	0.83	-0.08
I feel confident in my skills to manage and navigate the work environment during my internship	4	4	.06	-0.22	4	4	0.99	-0.09
I feel confident in my ability to manage interactions and relationships with different people during my internship	4	4	<b>.01</b>	-0.33	4	4	0.38	-0.11
I feel confident in my ability to deal effectively and professionally with work conflict and problems that might arise during my internship	4	4	<b>.03</b>	-0.26	4	4	0.34	-0.03
I feel confident in my ability to communicate effectively and professionally, with others during my internship	4	4	.08	-0.21	4	4	0.81	-0.06
I feel confident in my ability to manage time properly and efficiently during my internship	4	4	<b>.01</b>	-0.29	4	4	0.62	-0.08
I feel confident in my ability to practice leadership skills during my internship	4	4	.46	-0.09	4	4	0.46	-0.04
I feel confident in my ability to work cooperatively with teams during my internship	4	5	.08	-0.21	4	4	0.72	-0.002
I feel confident in my ability to	4	4	<b>.04</b>	-0.24	4	4	0.89	-0.02

exercise critical thinking skills during my internship								
I feel confident in my ability to employ problem-solving skills during my internship	4	4	<b>.001</b>	-0.38	4	4	0.82	-0.06
I feel confident in my ability to maintain and practice a high-level of professionalism during my internship	4	4	.45	-0.11	4	4	0.55	-0.16
I feel confident in my ability to practice ethics in the workplace and maintain ethical conduct during my internship	4	5	.39	-0.10	5	5	0.17	-0.16
I have the required knowledge to start my internship	3	4	<b>&lt;.001</b>	-0.52	3	4	0.16	-0.19
I have the required skills to start my internship	3	4	<b>&lt;.001</b>	-0.42	3	4	0.09	-0.20
I feel well-prepared to start my internship	3	4	<b>&lt;.001</b>	-0.54	3	4	0.44	-0.13
I feel confident to start my internship	4	4	<b>&lt;.001</b>	-0.43	4	4	0.24	-0.01

*Median Data from 1=strongly disagree to 5=strongly agree  
P-value significance at 0.05*

A total of 39 students from the control group completed the two rounds of the survey. Similar to the experimental group, the majority of the students were female and from the PH program (Table 2). Positive responses in the pre-assessment were highest in students' confidence in their ability to interact with different people (77%, n = 30), whereas the negative responses in

the pre-assessment were highest in networking and building professional connections (10%, n = 4) (Table 3). The assessment of students' confidence and knowledge in the second round of data collection did not show a stable trend of either increased or decreased confidence or knowledge due to varied responses (Table 3). The difference in assessment pre- and post-program of the control group was not significant for all areas, as shown in Table 4.

Students' assessment of the internship preparation program is presented in Table 5. Overall, the majority of students strongly agreed or agreed with the program addressing their needs as well as the program's structure, timing, and setting. However, 29% (n = 10) of the students did not agree that the timing of the workshops was convenient. Moreover, the majority of the students strongly agreed or agreed to recommend continuing to offer the program (97%, n = 33) and to recommend it to their colleagues (85%, n = 29).

**Table 5. Students feedback on the internship preparation program (experiment group, N=34)**

Statement	Strongly agree N(%)	Agree	Neutral	Disagree
The Internship Preparation Program has addressed my learning needs	5(15%)	20(59%)	8(24%)	1(3%)
The Internship Preparation Program was well structured	11(32%)	13(38%)	10(29%)	0
The Internship Preparation Program teaching methods were appropriate to the setting	13(38%)	16(47%)	5(15%)	0
The timing of the workshops was convenient to me	11(32%)	9(26%)	4(12%)	10(29%)
I am likely to recommend to the College to continue offering the Internship Preparation Program in the future	21(62%)	12(35%)	1(3%)	0
I am likely to recommend this program to my colleagues	19(56%)	10(29%)	5(15%)	0

*Note: None of the students reported strongly disagree for any of the statements*

## Discussion

The present study assessed the students' level of confidence and knowledge before and after attending an internship preparation program in a Saudi health sciences institution. The findings of this study, which demonstrate a significant enhancement in the students' level of confidence and knowledge across several domains following participation in the internship preparation program, resonate with a growing body of literature highlighting the positive impact of such interventions on student development (26,27). For instance, a study on medical students found that an internship preparatory program improved their self-reported confidence in managing common procedural skills (27). Additionally, the current findings showed that internship preparation programs can equip students with the appropriate professional and personal skills needed in the labor market. This finding is consistent with those of other studies that discussed the importance of intern preparedness programs in improving students' essential skills to facilitate a successful transition to their internship (26). The internship preparation program's approach to addressing several domains appears to have effectively addressed a potentially "difficult and often neglected area" within the Saudi health sciences curriculum, ultimately leading to improved student readiness.

The significance of the internship preparation program is further underscored by examining the control group. While mirroring the experimental group's demographics, students of the control group exhibited a different trajectory in their self-assessments. While the control group's pre-assessment confidence was highest in interacting with different people (77%) and lowest in networking (10%) – similar to the initial profile of the experimental group – their subsequent self-assessment revealed a varied pattern without a stable trend of increased confidence or knowledge.

This absence of consistent positive change in the control group, in contrast to the positive improvement in the assessment of their confidence and knowledge observed in the experimental group (in the post assessment), suggests that the improvements seen in the experimental group are likely attributable to the internship preparation program.

The results show positive responses in the pre-assessment of students' ability to work effectively with teams. A possible explanation is that working in teams is incorporated in most of the courses within the students' undergraduate studies. Previous studies suggested that working in teams can have several benefits for students. Teamwork tasks in educational settings provide students with realistic experiences in cooperation, group decision-making, and communication, leading to higher student achievement, improved critical thinking skills, and better interpersonal skills (28,29).

Positive responses in the pre-assessment were also noted in students' ability to practice ethics in the workplace and maintain ethical conduct during their internship. Previous studies have reported different perceptions of students regarding ethical practice. For example, Rawlins (30) found that while students recalled addressing ethics in classes, they generally did not feel prepared for managing ethical issues. However, other studies have pointed out the importance of professional ethics in the training of college students, highlighting the need for ethical awareness and understanding during internships (31,32). Overall, these studies recognize the importance of ethics education in promoting ethical understanding and professional development of the students (33).

The findings of this study showed negative responses in the pre-assessment in the areas of handling professional interviews and writing CVs. These findings highlight the areas where students felt less prepared or lacked confidence. Accumulating evidence suggests that students

have varying levels of preparedness and confidence about handling professional interviews and writing CVs. Kont et al. (34) showed that students valued the opportunity to engage with industry professionals, which helped them practice networking and professional communication. Similar findings were demonstrated by van Ede et al. (35), who emphasized the pressure and challenges students face during professional development, suggesting the need for strategies to address these challenges and better prepare them for future careers.

A notable finding of this study revealed that 29% (n=10) of the participating students expressed disagreement with the convenience of the program timings. This feedback gains significant context when considering that **the program sessions were scheduled during students' designated activity hours**. While this time slot may have been intended to maximize student availability, the 29% dissatisfaction rate suggests a potential conflict with specific activities or commitments students typically undertake during these hours. A more nuanced consideration of its implications, particularly concerning the potential for scalability, is warranted. The students reporting the disagreement were from one specific program, public health. Further understanding of underlying reasons would be essential to allow for expanding the reach and impact of the internship preparation program to a larger and more diverse student population. Attempting to accommodate students varied schedules of different programs without straining resources and personnel and logistic coordination would necessitate a proactive and flexible approach to program scheduling. Exploring options such as offering sessions at a single day-long event, for example could prove beneficial. However, such adaptations must be carefully balanced against the practical limitations of resource allocation and the need to maintain the integrity and interactive elements of the sessions. Ultimately, a thoughtful and responsive strategy to scheduling will be crucial in ensuring the sustainable growth and widespread accessibility of the program.

The study's findings highlight the important role of higher education institutions in preparing prospective professionals for the job market. Positive improvements in students' levels of confidence and knowledge call for structured and active efforts from higher education institutions to facilitate students' transition to professional fields. The findings of this study should be interpreted in light of several limitations. First, the small sample size drawn from a single institution in Saudi Arabia, with a majority female students limits the generalizability of the findings to other contexts and student populations. In other words, the study population introduces institutional-specific biases that may not be present in other educational settings. Second, the non-randomized design introduces the potential for selection bias. Third, the reliance on self-reported data through online surveys introduces respondents' subjectivity and response bias. While efforts were made to ensure anonymity and encourage honest responses, the potential for overestimation of confidence and knowledge gains cannot be entirely ruled out. Finally, the study focused on immediate rather than long-term assessment of the internship preparation program. While the post-program assessment indicated positive changes, the sustained impact of the program on students' actual internship performance, their transition into the workforce after graduation, and their long-term career success remains unknown.

Acknowledging these limitations provides a nuanced understanding of the study's findings and highlights important directions for future research. Further research involving larger and more diverse samples across multiple institutions and geographical locations is needed to determine the broader applicability of the study's results. Furthermore, objective measures of skills and knowledge could complement self-report data in future studies. Additionally, longitudinal studies tracking students' progress throughout their internships and into their early careers would provide valuable insights into the lasting effects of such preparation programs.

## **Conclusion**

Internships are considered important gateways between academia and professional settings that help address gaps in skills between higher education systems and job market needs. The study reported the experience of developing the internship preparation program to reduce the gap between academia and professional fields and to equip students with essential professional competencies and skills. The study's findings indicated a significant improvement in students' confidence and knowledge following their participation in the internship preparation program at a Saudi health sciences institution. Such findings not only affirm the importance of structured internship preparation but also contribute to the existing literature by demonstrating how targeted educational interventions can enhance competencies among students and thus equip them with appropriate skills to successfully navigate the job market. Ultimately, integrating such programs into educational practices can significantly enhance the effectiveness of healthcare education by ensuring that graduates are well-equipped to meet the demands of the evolving job market. Adopting internship preparation programs as an educational best practice would contribute to narrowing the gap between academia and the job market. The study's findings introduce several implications for policies, specifically for health institutions, to adopt internship preparation programs as an integral part of health-related undergraduate curricula. This would ensure a standardized approach to preparing future healthcare professionals. Given observed improvements in students' knowledge and confidence, curriculum designs can be updated to incorporate dedicated modules focusing on skills and competencies necessary for students' transition from academic to professional contexts. By implementing these policy and curriculum adjustments, Saudi health sciences institutions can more effectively ensure their graduates are well-prepared to

meet the evolving demands of the national healthcare landscape, ultimately strengthening the healthcare workforce. These programs are essential in enhancing students' technical competencies and confidence, ultimately better preparing them for their future professions.

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### **Ethical considerations**

The survey did not require any names, emails, phone numbers, or any other personal information, which guarantees the respondent's privacy. Ethical approval from the institutional review board of IAU has been obtained on 29/05/2022 with IRB Number (IRB – [2022-03-212](#)).

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