



## Original article

## Assessing factors influencing pharmacy interns career choices in Saudi Arabia

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## ABSTRACT

**Background:** The number of students enrolled in the colleges of pharmacy in Saudi Arabia is high, and the number of pharmacy graduates expected to join the workforce in the coming years is expected to grow. There are limited number of studies that assess factors influencing pharmacy students' career choices in Saudi Arabia in the literature. The aim of this study was to assess the factors that influence career goals and to investigate students' perceptions about their career goals.

**Methods:** This study was a prospective cross-sectional survey targeting PharmD students in their last year (i.e. interns) in the academic year of 2018 – 2019. A questionnaire containing four parts and total questions of 32 was completed by interns. Data collected and analyzed using Qualtrics. This study was reviewed and approved by the Unit of Biomedical Ethics Research Committee at King Abdulaziz University.

**Results:** 93 were reachable via email and all of them attended the interview and completed the survey (100% response rate). The most important job considerations were: work environment (67.7%), advancement opportunities (55.9%), salary (52.7%), benefits (40.9%), flexible work schedule (34%), and finally geographic region (29%). The top ranked career goal upon graduation were in industry and drug company (35.5%), clinical pharmacy (26.9%), (14%) academics/research and hospital pharmacy setting (inpatient/outpatient) (14%) each, and regulatory and community pharmacy (3.2% and 4.3%, respectively)

**Conclusion:** This study showed that work environment, advancement opportunities, and salary were the most important job consideration for pharmacy interns. The top ranked career goals were industry and drug company followed by clinical pharmacy. Further studies across Saudi Arabia are needed to confirm our results.

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## 1. Introduction

Pharmacy education in Saudi Arabia (SA) has been receiving a lot of attention from both government and private sectors as the numbers of colleges have leaped from one college of pharmacy in 1999 to 27 colleges in pharmacy in 2018. (Alomran et al., 2018) Furthermore, this growth has been reflected on the quality and outcomes of some of these colleges as they acquire national and

international accreditations and rank in the top colleges of pharmacy in the world in various academic rankings of world universities such as the QS ranking, where King Abdulaziz University ranks 50–100 in the field of Pharmacy. (QS Ranking, 2020) Most colleges in Saudi Arabia now offer a Doctor of Pharmacy degree (PharmD), in which students must complete a six-year entry level program including an experiential education period where they apply their knowledge in practical settings for a minimum of one academic year; while others still offer a 5-year Bachelor of Pharmacy degree (Almaghaslah et al., 2019). In 2018, the number of students enrolled at all colleges of pharmacy in SA was estimated to be 14,004 students and by 2022 the number of pharmacy graduates is expected to be 3,118 pharmacists that are ready to join the workforce. (Alomran et al., 2018) As of the last census in 2019, there are 29,090 registered pharmacists practicing in different areas. However, some areas of pharmacy practice are of desperate need for Saudi pharmacists to maintain sustainability for the long

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run; and its expected that 17,000 additional pharmacists are required to meet the demand in all fields of pharmacy by 2026. (Balkhi et al., 2020) These areas include community pharmacy, industrial pharmacy and clinical pharmacy. (Saudi Commission for Health Specialties, 2019)

There is a limited number of studies that assess factors influencing pharmacy students' decision on choosing their careers in the literature. We have identified studies that look at factors influencing selection of job location and intergender and interethnic disparities. (Carvajal and Hardigan, 1999; Pearson and Andres, 2010) In one study, evaluating factors influencing pharmacy students' career choices it was found that pharmacy students were influenced by the work environment and financial incentives (i.e. benefits) and favored working in retail settings. (Savage et al., 2009) Another study concluded that benefits, geographical locations, were the factors mostly influencing future pharmacist's decision in choosing future careers. (Hasan et al., 2010) Age, gender, and previous work experience was also reported to be among factors influencing career choices. (Ubaka et al., 2013). In Saudi Arabia; also, we currently have limited data on what factors influence future pharmacists' decision to go into a specific type of pharmacy career. A previous study done in 2015 looking at Saudi pharmacists' willingness to work in pharmaceutical industry found that that majority of students preferred clinical pharmacy as their career of choice and identifying having a bachelor's degree of pharmacy (versus a PharmD) as possible predictor of choosing working in the local drug industry. (Bin Saleh et al., 2015) Another study conducted in SA concluded that there is a lack of interest in working in community pharmacies and that decision might be influenced by financial incentives and cultural and societal perception towards working in such setting. (Alhomoud et al., 2019) More recently, a study was published looking at pharmacy students' future career preferences indicated that Saudi students preferred working at hospitals, followed by academia, and research centers respectively. Pharmaceutical industry and community pharmacies were the least preferred. Factors identified affecting the career choice included personal interest, training experience and organizational reputation. Furthermore, they identified the most important job consideration as promotions and job vacancies in that field. (Balkhi et al., 2020).

These being the only published studies we identified to date, making it difficult for colleges of pharmacy to objectively develop their programs in accordance with market needs and it raises challenges for stakeholders in terms of attracting pharmacy graduates with the required future market skills to areas in SA and raises the need for more prospective on the issue to foster better understanding of the current pharmacy generation. The aim of this study was to assess the factors influencing career goals in Saudi pharmacy interns, perceptions about career choice, and to investigate the overall clinical experience of PharmD students during the internship year.

## 2. Methods

This study was a prospective cross-sectional survey targeting PharmD students in their last year (i.e., interns) in SA in the academic year of 2018 – 2019. The PharmD program at the Faculty of Pharmacy in King Abdulaziz University is a six-year program, with approximately 110 graduates every year. The internship year is a rotational based year that consists of eight rotations, in which interns are exposed to various level of experiences, which aimed to help them to be familiar with basic, clinical, professional, and administrative skills. They are mandated to spend four clinical rotations, one hospital pharmacy rotation, community pharmacy rotation, and the opportunity to choose two elective rotations

based on site availability and the approval of by the Training and Pharmaceutical Services Unit.

During the academic year of 2018–2019, there have been 100 interns distributed among different hospitals across the Kingdom. Between March 1, 2019 and May 2, 2019, interns were reached via their e-mail and invited to participate in the survey. Interns were asked to schedule an appointment with one of the authors in order to complete the questionnaire. During the appointment, the author explained the aim of the survey and the questions associated therewith.

The survey was adopted from several previous studies, (Savage et al., 2009; Ubaka et al., 2013; Bhagavathula et al., 2017) and was modified to suit the aim of this study. The questionnaire contained four parts and a total of 32 questions; demographic information (7 items); general job consideration after the graduation (6 items); career choice among the available sites in SA (7 items); and finally, the clinical skills they were exposed to during the internship year (12 items).

The first part of the questionnaire consisted of sociodemographic information, in which students answered the questions using free text. As for the second part, general job consideration, the students' answer was assessed using a 5-point Likert scale, in which (1 = least important and 5 = most important). The third part of the survey evaluated the students' perceptions about their career choice (career goals), where they could rank their options among the top six careers that included hospital pharmacy, clinical pharmacy, community pharmacy, industry/company, academic/research, and any job that is not related to pharmacy. Hospital pharmacy is the area of pharmacy that is responsible for the daily operation in inpatient, outpatient, intravenous room and extemporaneous preparation while clinical pharmacy provides direct patient care to optimize the therapeutic plans, prevent diseases, and promotes health. Further analyses were performed to evaluate the relationship between the top ranked career goals and the elective rotations, the extra summer rotations, and the most important job considerations (received 5 points on Likert scale). The final part of the survey focused on the clinical training opportunities that the students might be exposed to by the end of each rotation. The answers of this part were assessed using a 4-point Likert scale (1 = not applicable, 2 = did not occur, 3 = partially occurred, 4 = definitely occurred).

### 2.1. Data analysis

Data were collected and analyzed using Qualtrics, a web-based survey tool (Qualtrics, Provo, UT) available on <https://www.qualtrics.com>. This study was reviewed and approved by the Unit of Biomedical Ethics Research Committee at King Abdulaziz University (approval number: PH-1442–35).

## 3. Results

Out of 100 interns, 93 were reachable via email and all of them attended the interview and completed the survey (100% response rate). The demographic data of the enrolled students is summarized in (Table 1). The interns age ranged from 23 to 28 years, with female representing 57% of the interns. The cumulative grade point average (GPA) was 3.9 out of 5. The interns were distributed across eight hospitals and the majority received their internship training at King Abdulaziz University Hospital (KAUH) (65%). Almost half of the interns (45.6%) regularly participated in ward rounds along with mentors. About 19.4% of the interns chose one elective rotation to be a clinical rotation while 19.4% chose both electives as clinical rotations. Moreover, about 37% of the interns have taken

**Table 1**  
Students demographic data.

	Year	N (%)
Age	23	24 (25.8%)
	24	49 (52.7%)
	25	7 (7.5%)
	26	7 (7.5%)
	27	5 (5.4%)
	28	1 (1.1%)
Gender	Male	40 (43%)
	Female	53 (57.0%)
Cumulative GPA, mean (SD)	3.90 (0.66)	
Number of Clinical Rotations	N	N (%)
	4	57 (61.3%)
	5	18 (19.4%)
	6	18 (19.4%)
Number of Elective Rotation	N	N (%)
	1	42 (45.2%)
	2	51 (54.8%)
Extra Summer Training, n (%)	34 (36.6%)	
Participate in ward rounds along with mentors regularly	42 (45.2%)	

an extra rotation (in industry or drug companies) during the summer of their fourth or fifth year, after they finished their summer training requirements of community and hospital pharmacy rotation.

The following were the most important job considerations that affected student's selection (Table 2): work environment (67.7%), advancement opportunities (55.9%), salary (52.7%), benefits (40.9%), flexible work schedule (34%), and finally geographic region (29%). The top ranked career goal upon graduation (Table 3) was in industry and drug company (35.5%) followed by clinical pharmacy (26.9%). There were equal number of interns (14%) who ranked academics/research and hospital pharmacy setting (inpatient/outpatient) as their top future career. Regulatory (i.e. Saudi Food and Drug Authority) and community pharmacy represented the least ranked future careers (3.2% and 4.3%, respectively). There were two interns (2.2%) who ranked working outside the pharmacy profession as their top choice. Analysis of the relationship between the top ranked career goals and the elective rotations showed that the highest percentage of elective rotations were in industry and drug company (19.4%) for those who ranked industry and drug company as their top career goal (Table 4). Moreover, 20.4% of the elective rotations were in clinical pharmacy for interns who picked clinical pharmacy a top rank career goal. Table 5 revealed that the majority of extra summer rotations among interns who ranked industry and drug company as the top career goal were in the same field. However, the majority of extra summer rotations were in a different

**Table 2**  
Job considerations affecting students' selection for a future job.

Question	1 N (%)	2 N (%)	3 N (%)	4 N (%)	5 N (%)
Benefits (e.g. leave, allowances)	3 (3.2%)	1 (1.1%)	15 (16.1%)	36 (38.7%)	38 (40.9%)
Salary	3 (3.2%)	5 (5.4%)	8 (8.6%)	28 (30.1%)	49 (52.7%)
Geographic location	6 (6.5%)	8 (8.6%)	26 (28.0%)	26 (28.0%)	27 (29.0%)
Work environment	4 (4.3%)	0 (0.0%)	7 (7.5%)	19 (20.4%)	63 (67.7%)
Advancement opportunities	3 (3.2%)	2 (2.2%)	12 (12.9%)	24 (25.8%)	52 (55.9%)
Flexible work schedule	3 (3.2%)	3 (3.2%)	29 (31.2%)	26 (28.0%)	32 (34.4%)

(1 = least important to 5 = most important)

field for those who chose clinical pharmacy as the top career goal. The relationship between the most important job considerations and the top ranked career goals analysis confirmed that work environment, advancement opportunities, and then salary were the highest among the majority of the top ranked career goals (Table 6).

The majority of interns (82.8%) believed that the training opportunities (i.e. being exposed to different rotations) during the internship year helped them develop professional maturity and responsibility to contribute to the care of the patients (Table 7). The internship helped 70 interns (75.3%) to develop communication skills needed to establish pharmacist-patient therapeutic relationship and empathy. Moreover, training opportunities contributed to the interns' ability to interview patients and the interns' problem-solving skills in approximately 74.2% and 70% of the interns, respectively. Seventy-three interns (78.5%) believed their ability to prioritize the identified drug-related problems, which has developed during the internship year. There were 59 interns (63.4%) who were able to integrate the theoretical aspects learned in the PharmD program for the assessment and resolution of drug therapy problems during the internship year. The documentation skills using pharmaceutical care plans, including the drug-related problem, recommendations, monitoring plans and follow-up were the least skills that have been developed after the internship year (57% of the interns). The internship year also helped to develop the following: growing knowledge base of disease processes and therapies (79.6%), inter-professional communication skills and working relationship (74.2%), expanding exposure to patient records and their utilization to provide care (81.7%), understanding of real and perceived barriers to providing pharmaceutical care in practice and how these may be overcome (59.1%), and expanding opportunity to interact with patients and health care providers to improve clinical skills and confidence (70%).

#### 4. Discussion

The factors that influence the career goals and the overall clinical experience of PharmD students during their internship year have been identified. Work environment, advancement opportunities, and salary were the three most important job considerations when applying for a job. Pharmacy industry and clinical pharmacy were the two most preferred career goals for the interns in our institution.

With the growing demand on Saudi pharmacists, it is important to understand the factors that influence the students' selection of future job. According to the findings of this study, participants believed that the work environment is the most important job consideration when selecting a job, followed by advancement opportunities and then salary. The analysis of the relationship between the most important job considerations and the top ranked career goals confirmed these results. This is similar to findings from Bin Salah et al. (2015), where 77% of the respondents believed that work environment and salary were the most important job

**Table 3**  
Pharmacy students' career goals after graduation.

Question	1 N (%)	2 N (%)	3 N (%)	4 N (%)	5 N (%)	6 N (%)	7 N (%)
Hospital (inpatient/outpatient)	13 (14.0%)	11 (11.8%)	22 (23.7%)	24 (25.8%)	12 (12.9%)	8 (8.6%)	3 (3.2%)
Clinical Pharmacy	25 (26.9%)	20 (21.5%)	20 (21.5%)	7 (7.5%)	7 (7.5%)	7 (7.5%)	7 (7.5%)
Community Pharmacy	4 (4.3%)	7 (7.5%)	12 (12.9%)	14 (15.1%)	19 (20.4%)	19 (20.4%)	18 (19.4%)
Industry / Company	33 (35.5%)	14 (15.1%)	11 (11.8%)	17 (18.3%)	4 (4.3%)	10 (10.8%)	4 (4.3%)
Academics/ Research	13 (14.0%)	14 (15.1%)	9 (9.7%)	10 (10.8%)	14 (15.1%)	16 (17.2%)	17 (18.3%)
Outside Pharmacy profession	2 (2.2%)	4 (4.3%)	2 (2.2%)	5 (5.4%)	15 (16.1%)	25 (26.9%)	40 (43.0%)
Regulatory (SFDA)	3 (3.2%)	23 (24.7%)	17 (18.3%)	16 (17.2%)	22 (23.7%)	8 (8.6%)	4 (4.3%)

Numbers 1–7 is the ranking of each choice by the survey takers

**Table 4**  
The relationship between pharmacy interns top career goals after graduation and elective rotation.

Top career goals	Pharmacy elective rotation					
	Clinical N (%)	industry/CompanyN (%)	AdministrationN (%)	CommunityN (%)	Hospital N (%)	Total N (%)
Industry / Company	10 (10.8%)	18 (19.4%)	3 (3.2%)	1 (1.1%)	1 (1.1%)	33 (35.5%)
Clinical Pharmacy	19 (20.4%)	4 (4.3%)	1 (1.1%)	0 (0%)	1 (1.1%)	25 (26.9%)
Academics/ Research	5 (5.4%)	6 (6.5%)	2 (2.2%)	0 (0%)	0 (0%)	13 (14.0%)
Hospital (inpatient/outpatient)	3 (3.2%)	2 (2.2%)	0 (0%)	3 (3.2%)	5 (5.4%)	13 (14.0%)
Community Pharmacy	0 (0%)	0 (0%)	2 (2.2%)	1 (1.1%)	1 (1.1%)	4 (4.3%)
Regulatory (SFDA)	1 (1.1%)	1 (1.1%)	0 (0%)	0 (0%)	1 (1.1%)	3 (3.2%)
Outside Pharmacy profession	1 (1.1%)	1 (1.1%)	0 (0%)	0 (0%)	0 (0%)	2 (2.2%)
<b>Total</b>	39 (41.9%)	32 (34.4%)	8 (8.6%)	5 (5.4%)	9 (9.7%)	*93 (100%)

\*The impact of the first elective rotation was included in this analysis since not all interns had the chance to obtain a seat for the second elective rotation due to limited training sites (assigned to them by the Training and Pharmaceutical Services Unit)

**Table 5**  
The relationship between pharmacy interns top career goals after graduation and extra summer training.

Top career goals	Extra summer rotation			
	Clinical Pharmacy	Industry / Company	Community Pharmacy	Hospital Pharmacy
Industry / Company	0 (0%)	8 (8.6%)	1 (1.1%)	4 (4.3%)
Clinical Pharmacy	3 (3.2%)	7 (7.5%)	0 (0%)	0 (0%)
Academics/ Research	0 (0%)	5 (5.4%)	0 (0%)	2 (2.2%)
Hospital (inpatient/outpatient)	0 (0%)	3 (3.2%)	0 (0%)	0 (0%)
Community Pharmacy	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Regulatory (SFDA)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Outside Pharmacy profession	0 (0%)	0 (0%)	0 (0%)	0 (0%)
<b>Total</b>	3 (3.2%)	23 (24.7%)	1 (1.1%)	6 (6.5%)

**Table 6**  
The relationship between pharmacy interns top career goals after graduation and the most important job considerations.

Top career goals	Most Important Job considerations affecting students' selection for a future job					
	Benefits (e.g. leave, allowances) N (%)	Salary N (%)	Geographic location N (%)	Work environmen N (%)	Advancement opportunities N (%)	Flexible work schedule N (%)
Industry / Company	13 (14.0%)	19 (20.4%)	12 (12.9%)	23 (24.7%)	22 (23.7%)	10 (10.8%)
Clinical Pharmacy	11 (11.8%)	11 (11.8%)	4 (4.3%)	19 (20.4%)	15 (16.1%)	6 (6.5%)
Academics/ Research	5 (5.4%)	8 (8.6%)	6 (6.5%)	8 (8.6%)	8 (8.6%)	4 (4.3%)
Hospital (inpatient/outpatient)	6 (6.5%)	7 (7.5%)	2 (2.2%)	6 (6.5%)	4 (4.3%)	5 (5.4%)
Community Pharmacy	1 (1.1%)	3 (3.2%)	2 (2.2%)	3 (3.2%)	1 (1.1%)	3 (3.2%)
Regulatory (SFDA)	2 (2.2%)	1 (1.1%)	1 (1.1%)	2 (2.2%)	2 (2.2%)	2 (2.2%)
Outside Pharmacy profession	0 (0%)	0 (0%)	0 (0%)	2 (2.2%)	0 (0%)	2 (2.2%)
<b>Total</b>	38 (40.9%)	49 (52.7%)	27 (29.0%)	63 (67.7%)	52 (55.9%)	32 (34.4%)

considerations. (Bin Saleh et al., 2015) This is also similar to findings from a study that took place in the United States where work environment was the most important job consideration for students when choosing a career. (Savage et al., 2009) In contrast, Alhomoud et al. (2019), found that advancement in the profession, job openings in a certain field, and salary were the three most important factors that influence the students' selection of future job. (Alhomoud et al., 2019) In addition, a study by Savage et al. (2009), found that salary and advancement opportunities were

the two least important job considerations on students' career choices. (Savage et al., 2009)

The preferred career goals were pharmacy industry and clinical pharmacy, which are different from findings of other studies. Alhomoud et al. (2019) surveyed undergraduate pharmacy students at various Colleges of Pharmacy in SA and found that hospital pharmacy was the preferred career goal in half of the students, followed by academia and research. Pharmaceutical industry and community pharmacy were the least preferred career goals.

**Table 7**  
The impact of the internship year on student's clinical skills and knowledge.

Question	Yes N (%)	Partially N (%)	No N (%)
Develop professional maturity and responsibility to contribute to patient care.	77 (82.8%)	15 (16.1%)	1 (1.1%)
Develop communication skills to establish pharmacist-patient therapeutic relationship and empathy.	70 (75.3%)	19 (20.4%)	4 (4.3%)
Develop ability to interview patients to obtain relevant information.	69 (74.2%)	21 (22.6%)	3 (3.2%)
Develop problem solving skills to assess patient's drug therapy and medical conditions to identify drug-related problems.	65 (69.9%)	24 (25.8%)	4 (4.3%)
Develop ability to prioritize the identified drug-related problems in the order to be addressed.	73 (78.5%)	16 (17.2%)	4 (4.3%)
Integrate the theoretical aspects learned in the PharmD program for the assessment and resolution of drug therapy problems.	59 (63.4%)	30 (32.3%)	4 (4.3%)
Develop documentation skills using pharmaceutical care plans, including the drug-related problem, recommendations, monitoring plans and follow-up.	53 (57%)	37 (39.8%)	3 (3.2%)
Develop growing knowledge base of disease processes and therapies.	74 (79.6%)	17 (18.3%)	2 (2.2%)
Develop inter-professional communication skills and working relationship.	69 (74.2%)	23 (24.7%)	1 (1.1%)
Expand exposure to patient records and their utilization to provide care.	76 (81.7%)	14 (15.1%)	3 (3.2%)
Expand understanding of real and perceived barriers to providing pharmaceutical care in practice and how these may be overcome	55 (59.1%)	35 (37.6%)	3 (3.2%)
Expand opportunity to interact with patients and health care providers to improve clinical skills and confidence	65 (70%)	25 (26.9%)	3 (3.2%)

(Alhomoud et al., 2019) Another study that explored job preference of interns at King Saud University in 2015 in Riyadh, found that the hospital setting was the preferred area of work rather than pharmacy industry. (Bin Saleh et al., 2015) In addition, A study by Ghazzawi et al. (2017) looked at the perception of female interns in Jeddah found that approximately half of the respondents preferred to work in the government sector and approximately 20% preferred to work in the academic field. (Ghazzawi et al., 2017)

A few possible explanations for these differences could stand. One explanation is that 74% of the respondents in Alhomoud et al. (2019) and 100% of the respondents in Ghazzawi et al. (2017) were female. It's a cultural perception that working in the government sector or in the academic field mean fewer working hours compared to working in other places such as pharmaceutical companies. Another possible explanation is the cohort group in each study. In our study, we only included interns at the end of their training year. However, in Alhomoud et al. (2019) they surveyed students from all education levels, and in Ghazzawi et al. (2017), they surveyed fifth-year students, sixth-year students, and new graduates. During their early summer training, pharmacy students are exposed to hospital pharmacy but not industry or clinical pharmacy. This might explain the findings from other studied that surveyed students from all education levels. Our interns could have been exposed to different experiences during their early summer training and advanced training (i.e. internship year) that they have a different view of their future. In fact, the majority of the extra summer training were in industry and drug company, which may have contributed to choosing the field of industry and drug company as the top ranked career goal. However, it should be noted the number of interns who received extra summer training is relatively low (37%) and future studies with higher percentages are needed to evaluate the impact of extra summer training (be-

yond hospital and community pharmacy training) on the future career goal.

Another possible explanation is the level of training students received before graduation. The relationship between the elective rotations and the top ranked career goals analysis revealed that the elective rotation impacted the choice of the career goal. In Bin Saleh et al. (2015), eighty-two percent of the students surveyed believed they have received adequate training in hospital pharmacy and approximately 84% believed that they have not received any training for pharmaceutical companies. However, the majority of our interns were exposed to pharmaceutical companies during the summer of their fourth or fifth year and in their elective rotations during the internship year.

Working in industry and pharmaceutical companies were the career of choice for 35.5% of the interns at our institution. Most of the pharmaceutical companies are located in rural areas and away from the city. The perception was that not a large percentage of graduates are motivated to work in pharmaceutical companies because of the geographical location, as most of these companies are located in places away from the cities. However, the findings of our study showed that geographical location is the least important job consideration affecting students' selection for a future job.

Two possible explanations might stand. With more vacancies, job opportunities and promising advancement of career available in pharmaceutical companies, more graduates might be considering pharmaceutical companies regardless of the longer working hours. Another possible explanation for students choosing pharmaceutical companies is the Faculty of Pharmacy's multiple agreements with multi-national pharmaceutical companies for training that is ended with employment. This might motivate interns to consider pharmaceutical companies.

With the 2030 economic vision of the country, the focus is on economic growth and job opportunities of Saudi citizens in all sectors, including healthcare. More job positions will be available in pharmaceutical companies. The importance of the pharmaceutical companies might have been emphasized to pharmacists especially during the Covid-19 pandemic. The medical community including healthcare providers, patients, and policy makers relayed on pharmaceutical companies to manufacture a vaccine emphasizing the importance of the pharmaceutical industry. Exploring the perspective of the 2019–2020 cohort and identifying career choices are interesting topics for future work.

In this study, only 4.3% of interns have chosen community pharmacy as their career of choice. Our findings are similar to the findings from a study that looked at the perception of pharmacy students from different universities around the Kingdom. Balkhi et al. (2020) found that only 17% of the 600 students they surveyed would consider working at a community pharmacy and only 5% considered community pharmacy as their career goal. (Balkhi et al., 2020) In contrast, Bin Saleh et al. (2015), found that community pharmacy was the career choice for graduating students. (Bin Saleh et al., 2015) Another survey by Savage et al. (2009), found that community pharmacy was the preferred area of practice for more than half of their respondents.

Community pharmacy is the largest employment sector for pharmacists in SA. (Almaghaslah et al., 2019) However, the role of the pharmacists in community pharmacy is limited to medication dispensing and female do not prefer working in community pharmacy for cultural and social factors. (Almaghaslah et al., 2019) The new direction of the Ministry of Health is on expanding the role of the community pharmacies beyond the traditional role to include a variety of pharmaceutical and medical services such as obtaining and documenting the vital signs of the patients. This shift of the Ministry of Health might minimize the negative perception many pharmacists have about community pharmacies and create new job opportunities. However, recent studies such as

Balkhi et al. (2020) showed that 53.4% of the 600 students they recently surveyed did not have a clear understanding of community pharmacy. Therefore, further work is needed to align the pharmacy program learning outcomes with the need of the market, incorporate community pharmacy courses, and expose the students to the different opportunities in community pharmacies.

The impact of the internship year on students' clinical skills development was explored. The majority of students believed that the internship year impacted skills such as communication skills, problem-solving ability and interview skills. The experiential learning during the internship might be one reason for this development. Furthermore, the responsibilities given to interns might have played a role in this development. Interns have to communicate with their peers and with the medical and nursing teams on daily basis which requires strong communication skills. It is important that interns acquire these skills in the internship year, as it is very important skills to prepare them to start their career after graduation.

This study has a few limitations. Although the sample size included students in the 2018–2019 academic year, we might not be able to generalize findings as the sample might not be representative of all pharmacy interns in Saudi Arabia; however, being able to achieve a 100% response rate might help us eliminate non-responders bias within our sample. Another limitation is that the study examined students' career choice at one point of time, which might change over time or when the students are exposed to different experiences.

## 5. Conclusions

This study showed that work environment, advancement opportunities, and salary were the most important job considerations for pharmacy interns. The top ranked career goals were industry and drug company followed by clinical pharmacy. The majority of interns believed that the internship year helped them to develop different skills such as communication skills, problem-solving ability and interview skills. Further studies across Saudi Arabia are needed to confirm our results.

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## Author contribution

DB, MA, and SA designed the study. DB, MA, SA, AA, and HK collected the data. DB, MA, SA, AA, and HK double-checked the data collection. DB managed and analyzed the data, and all authors

helped interpret it. DB drafted the manuscript and all coauthors contributed to its revision.

## 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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