

Evaluation of Pharmacy Student Knowledge in Industry Pharmacy

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Pharmacy



Introduction

- Industry pharmacy is crucial in developing and bringing medications to market¹
- Industry pharmacy consists of functional areas such as Clinical Development, Regulatory Affairs, Medical Affairs and Marketing²
- Pharmacists account for about 40% of healthcare professionals in medical affairs³
- Education on industry pharmacy roles is limited⁴
- Student pharmacists feel ill-equipped at being competitive applicants and/or uninterested in industry pharmacy⁵

Specific Aim

- Examine the validity and reliability of a pilot questionnaire designed to measure pharmacy student's knowledge of industry pharmacy

Methods

Design:

- Survey-based cross-sectional study

Subjects:

- University of Arizona College of Pharmacy students
- Expressed interest in the College's Industry Pharmacists Organization (IPhO) chapter by Sept 22, 2021, or were IPhO members since Oct 1st, 2020
- Formed two comparison groups: those who participated in the IPhO case competition and those who did not

Measures:

- An electronic questionnaire was developed in Research Electronic Data Capture (REDCap)
- Five knowledge based multiple choice questions with once correct choice for each of the four industry areas
- Demographics assess factors that may affect questionnaire score
- Primary Endpoints: Questionnaire's overall reliability (between questions) and validity (difference in scores between groups)
- Secondary Endpoints: Reliability for each section of the questionnaire and differences in demographic subgroups
- Exploratory Endpoint: Average number of correct answers per section for each area of interest

Data Collection:

- An email notification with REDCap link was sent to subjects on 9/22/21 and reminder emails were sent after three and six weeks from the initial email

Data Analysis:

- A two-sample T-test was used to evaluate questionnaire validity (competition participant vs. nonparticipant, $\alpha = 0.05$)
- A Cronbach's alpha score was used to evaluate question reliability

Results

Table 1. Demographic Characteristics of Study Participants

Demographic Characteristics	Total N = 13	Group 1: Participated in IPhO Case Competition N = 4 (31%)	Group 2: Did not Participate in IPhO Case Competition N = 9 (69%)
Year In Pharmacy School			
P1	1	0 (0%)	1 (100%)
P2	4	1 (25%)	3 (75%)
P3	7	2 (29%)	5 (71%)
P4	1	1 (100%)	0 (0%)
Prior Industry Pharmacy Experience			
Yes	6	2 (33%)	4 (67%)
No	7	2 (29%)	5 (71%)
Interest in Specific Functional Area			
Clinical Development	1	0 (0%)	1 (100%)
Regulatory Affairs	2	0 (0%)	2 (100%)
Medical Affairs	7	2 (29%)	5 (71%)
Marketing	1	0 (0%)	1 (100%)
Unsure	2	2 (100%)	0 (0%)

The **primary reliability endpoint** for the entire questionnaire was a **Cronbach's alpha of 0.65**

Table 2. Cronbach's Alpha Overall and Per Section by Number of Correct Responses for Each Question

Characteristics	Cronbach's Alpha
Clinical Development	-1.86
Regulatory Affairs	0.35
Medical Affairs	0.68
Marketing	0.23
Total	0.65

The **primary validity endpoint** was the difference in average score (**52.5%** in participant group vs. **44.5%** in nonparticipant group)

Table 3. Average Number of Correct Answers Overall and by Subgroup

Scores	Total Average Number of Correct Answers (%)	Group 1: (Participated in IPhO Case Competition) Average Number of Correct Answers (%)	Group 2: (Did not Participate in IPhO Case Competition) Average Number of Correct Answers (%)	Two-sample t test
Overall	9.4/20 (47.0%); n=13	10.5/20 (52.5%); n=4	8.9/20 (44.5%); n=9	P value 0.4398
Year In Pharmacy School				
P1	5/20 (25%); n=1	-	5/20 (25%); n=1	-
P2	10.3/20 (51.3%); n=4	10/20 (50%); n=1	10.3/20 (51.3%); n=3	P value 0.8543
P3	8.9/20 (44.5%); n=7	9/20 (45%); n=2	8.8/20 (44%); n=5	P value 0.9537
P4	14/20 (70%); n=1	14/20 (70%); n=1	-	-
Prior Industry Pharmacy Experience				
Yes	10.3/20 (51.5%); n=6	11/20 (55%); n=2	10/20 (50%); n=4	P value 0.7777
No	8.6/20 (43%); n=7	10/20 (50%); n=2	8/20 (40%); n=5	P value 0.4181

Discussion

Demographics

- Most participants were 3rd and 2nd year students due to more access to club information and sign-up timing

Reliability

- Cronbach's alpha level=0.65, questionnaire is deemed reliable
- To improve the overall reliability in future studies, use a larger sample and rework questions that correlate low with the other questions in the subset
- Medical affairs questions had the highest reliability, perhaps due to all the items in the questionnaire being correlated well together

Validity

- There was no significant difference in average scores between the participant and nonparticipant groups
- Not possible to suggest that the IPhO case competition is a marker of external validity for this questionnaire
- The greatest difference between participant groups was in those that had no prior experience in industry pharmacy

Exploratory endpoint

- Area of interest did not affect score in that area aside from medical affairs, which had a larger population

Limitations

- Small sample size of 13 completed responses - study is not powered to measure a significant difference between the IPhO case competition participant group (n=4) and the nonparticipant group (n=9)
- Generalizability - not all pharmacy schools have an IPhO chapter established

Conclusion

- The data gathered from our questionnaire mildly supports that the questionnaire is reliable but does not support that the questionnaire is valid based on the marker of IPhO case competition participants

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