Manchester University

COLLEGE of PHARMACY, NATURAL & HEALTH SCIENCES

Evaluation of Student Pharmacists' Ability and Confidence Using Drug Information Resources to Analyze Drug-Drug Interactions

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BACKGROUND AND OBJECTIVE

Drug interaction management is essential in pharmacy practice, and of interest to the public and profession. The purpose of this study was to evaluate student pharmacists' ability and confidence using drug information databases to investigate a previously unknown drug-drug interaction and recommend appropriate course of action.

DESIGN AND METHODS

At MU Pharmacy, basic skills in drug information and evidence-based practice are introduced in PHRM 322 (Drug Information), a required, 2-credit hour, 16-week, Fall semester, P1 course. It is sequenced by therapeutic topic area (eg, interactions, pregnancy and lactation, injectable drugs) and incorporates a mixture of short and long activities. In order to evaluate long-term retention of skills using tertiary resources for managing drug interactions, a cross-sectional study was conducted where P1, P2, and P3 students were presented with three brief patient cases, each containing an interaction they had not yet encountered within the curriculum to be assessed in a 30-minute activity. Assessed interactions were selegiline-pseudoephedrine, sulfamethoxazole/trimethoprim-methotrexate, and flibanserin-ethinyl estradiol. Students were asked to select a drug information resource and determine the mechanism, clinical effects, severity, level of documentation, and course of action for each interaction. Overall performance was assessed on a 15-point scale (one point for each assessment item for each interaction), and students were asked to rate their confidence on a five-point scale for each interaction, yielding a 15-point confidence scale. The project was verified as exempt by the Manchester University Institutional Review Board.

RESULTS

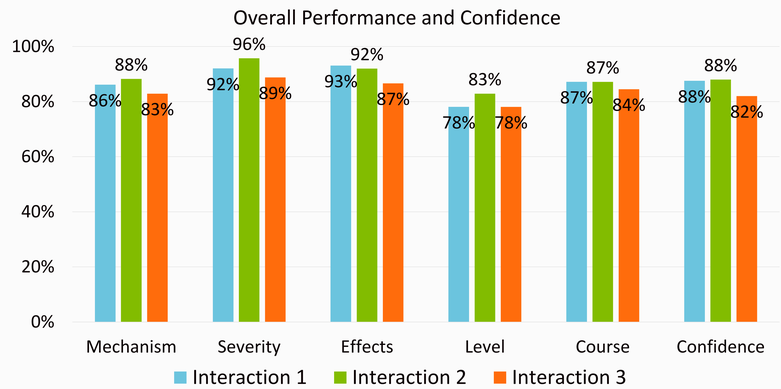
A total of 191 of 206 eligible students participated in the assessment activity (92.7% response rate) and 187 (90.8%) completed each assessment. Population characteristics, including subgroups of high performers (ie, performance score 15/15) versus low performers (ie, performance score 12/15 or lower) are described in the following table.

Population Characteristics	Overall Sample (n=191)	High Performers (n=58)	Low Performers (n=55)	P-Value*
Age (years, mean [SD])	25.7 (4.5)	25.9 (4.6)	26.4 (4.6)	0.63
Female (n [%])	112 (58.6)	37 (63.8)	26 (47.3)	0.09
GPA (mean [SD])	3.23 (0.33)	3.28 (0.34)	3.11 (0.37)	0.02
Work Experience (n [%])				0.26
Institutional	19 (9.9)	6 (10.3)	5 (9.1)	
Community	131 (68.6)	33 (60.0)	38 (69.0)	
Both	18 (9.4)	8 (13.8)	7 (12.7)	
Year (n [%])				
P1	65 (34.0)	14 (24.1)	14 (25.5)	0.87
P2	60 (31.4)	24 (41.4)	17 (30.9)	0.25
P3	66 (34.6)	20 (34.5)	24 (43.6)	0.32
Resource (n [%])**				
Lexicomp	159 (83.2)	40 (69.0)	39 (70.9)	0.82
Micromedex	77 (40.3)	21 (36.2)	21 (36.4)	0.99
Clinical Pharmacology	17 (8.9)	3 (5.2)	8 (14.5)	0.09
High Confidence	88 (46.1)	35 (60.3)	15 (27.3)	<0.001

*Unadjusted, high vs. low performers **Non-exclusive

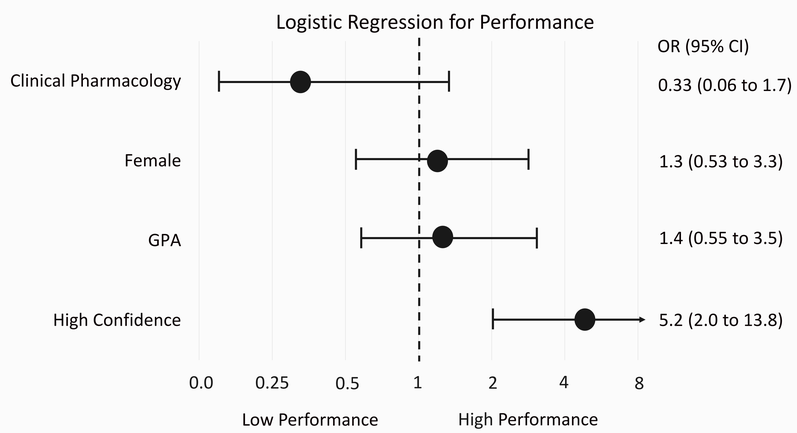
RESULTS (continued)

Aggregate completer performance (ie, percentage of available earned points for each assessment item) and confidence (ie, percentage of available claimed confidence points) for each interaction is illustrated in the following figure. Median performance by item and overall confidence results are illustrated in the subsequent table.



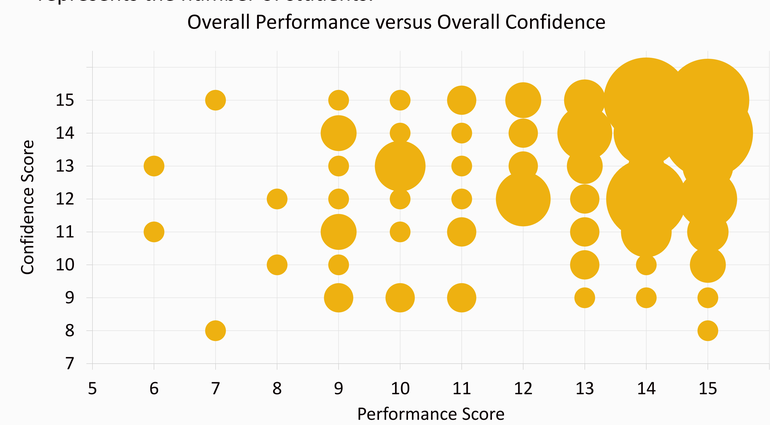
Performance on Assessment Activity by Item and Overall	Median (IQR)	Full Credit (n [%])
Mechanism	3 (2 to 3)	125 (66.8)
Severity	3 (3 to 3)	152 (81.3)
Clinical Effects	3 (3 to 3)	141 (75.4)
Level of Documentation	3 (3 to 3)	127 (67.9)
Course of Action	3 (2 to 3)	129 (69.0)
Overall Performance	14 (12 to 15)	58 (31.0)
Overall Confidence	13 (12 to 14)	88 (46.1)

Factors suggesting association with high or low performance were entered into a logistic regression model with results illustrated in the following figure.

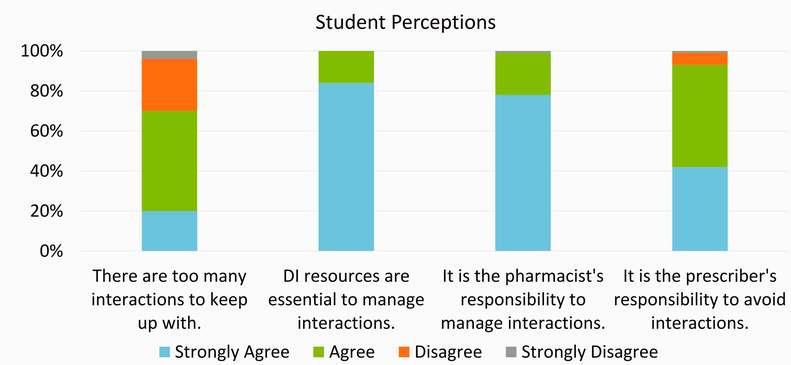


RESULTS (continued)

The following figure illustrates performance scores plotted against confidence scores for completers (following removal of two outliers). The size of the bubble represents the number of students.



Response to four survey items regarding student perceptions of drug interaction management for completers is described by the follow figure.



DISCUSSION AND CONCLUSION

We found generally high student performance and confidence in analyzing a drug-drug interactions using tertiary resources; however, a significant minority of students earned an overall performance score of 80% or less, suggesting need for continued practice and improvement. Most (nearly 70%) recommended appropriate action to manage each interaction. Notably, high self-rated confidence, not GPA, was the most important predictor of high performance suggesting most students had good self-awareness of their skill level. Survey results suggest students are engaged in preventing interactions and view it as an important pharmacist role but that many students are concerned regarding their ability to "keep up" with interactions. This highlights the importance of fluency using electronic resources, and underscores the fact that nearly 85% of our participants strongly agreed use of resources is essential for interaction management.