



Impact of peer assessment on student pharmacists' behaviors and self-confidence

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Abstract

Objective: To assess the impact that peer assessment has on student pharmacists' behaviors and self-confidence.

Methods: A 19-item, electronic survey instrument was sent to 161 third-professional-year student pharmacists enrolled in a one-credit, required integrated laboratory course. The survey instrument aimed to assess how experiences with peer assessment throughout the Doctor of Pharmacy curriculum had affected students' behaviors and self-confidence as well as identify factors that may influence the reception of peer feedback.

Results: One hundred forty-one (88%) responses were received. The majority (78%) of students agreed that they remembered the content of assessments provided by peers and that the assessments provided by peers were accurate. However, most students reported that receipt of feedback from an instructor is more meaningful than from a peer. Students were divided over the meaningfulness of anonymous peer review compared to an identified peer-reviewer. While 65% of students agreed that peer assessments have enhanced their learning, only 40% indicated that they reflected on previous assessments. The majority of students (85%) agreed that a positive peer assessment gave them more confidence in their abilities. Finally, most students agreed that peer assessments have helped them to identify personal strengths and future opportunities for growth.

Conclusions: Peer assessment is perceived by students to positively impact self-confidence, enhance learning behaviors, and aid in the identification of personal strengths and limitations. Most students agreed that receipt of feedback from an instructor is more meaningful than from a peer, but students were divided regarding the impact of anonymity and friendship.

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Introduction

Peer assessment, commonly used in continuing education and professional development, is generally defined as the application of standards to evaluate and provide feedback on the work of peers or colleagues.¹ Objective peer assessment is an important skill for student pharmacists to learn during their formal education. In didactic settings,

the peer-assessment process can be used for student evaluations, as well as faculty evaluations, as endorsed by the Accreditation Council for Pharmacy Education.² Beyond the didactic setting, pharmacists may also encounter peer assessment during post-graduate training, employment, and the manuscript peer-review process. Improvements in critical-thinking skills and self-assessment have been associated with the practice of peer assessment as well.³

Use of peer assessment during the training of health professional students has been studied in both didactic and experiential training venues.^{4–11} Two studies have examined the attitudes, perceptions, and the impact of peer assessment on medical students.^{4,5} While these studies only

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provide qualitative data, the results suggest that students may need more practice to become familiar with peer assessment. Additionally, results suggest that the practice of peer assessment improves confidence and enhances learning.⁴ Nofziger et al.⁵ investigated what types of peer feedback medical students remember and what reactions or transformations students experience as a result of peer assessment. Students recalled content about both positive and negative qualities expressed during peer assessments. Important transformations in awareness, attitude, or behaviors due to peer assessment were reported in 65% of students. The authors also reported that when specific areas for improvement were given, change was more likely to occur. Wagner et al.⁶ investigated the reliability and value of peer- and self-reported evaluations in the grading of pharmacy students and found that students graded their peers higher when compared to grades given by faculty members. The authors also surveyed alumni and found that of those who completed peer evaluations in school, 76% thought it was helpful.

Wu et al.⁹ studied student pharmacists' perceptions of and attitudes towards the use of peer assessment within a drug-literature evaluation course and found that students were more comfortable receiving than providing peer feedback (95.7% and 80%, respectively). However, the impact of the content from peer-assessment activities on student pharmacists has not been well studied. As such, the purpose of this study was to assess the impact that peer assessment has on student pharmacists' behaviors and self-confidence.

Methods

A convenience sample was identified of 161 third-professional-year student pharmacists who were enrolled in a one-credit, required integrated laboratory course. A 19-item questionnaire was constructed by investigators to assess how peer assessment throughout the curriculum has affected students' behaviors and self-confidence and to identify factors that may influence the reception of peer feedback. Responses to each item were recorded using a 5-point Likert scale (strongly agree, agree, undecided, disagree, and strongly disagree). An electronic invitation containing a hyperlink to the questionnaire was sent to all students enrolled in the integrated laboratory course. To encourage an adequate response rate, one reminder email was sent two weeks later, and students were compensated with five bonus points for participation to be applied to their final course grade. Qualtrics Survey SoftwareTM (Qualtrics Labs, Provo, UT) was used to design and distribute the survey electronically as well as maintain confidentiality of all responses. The project was approved by the University's Investigational Review Board with exempt status from regulations for the protection of human research subjects.

Several courses throughout the curriculum at our College of Pharmacy incorporate peer assessment. For example, an integrated laboratory course is required as part of the

core curriculum in all six didactic semesters, with students randomly assigned to five different sections of approximately 30 students. In these courses, students are required to give a variety of presentations on volunteer experiences, over-the-counter medications, prescription medications, disease states, and patient cases. The presentations are evaluated by college faculty and other students in the section. These peer assessments do not determine the student's grade, but rather provide feedback on presentation style and content. Several other courses throughout the curriculum also require peer assessment. Since multiple opportunities exist for peer assessment, the investigators were interested in the impact of these evaluations on subsequent student behaviors.

Results

A total of 141 complete responses were received, yielding a response rate of 88% (141/161). Results showed that 78% (110/141) of students agreed that they remember the content of assessments provided by peers, and 78% (110/141) agreed that the assessments provided by peers were accurate. Students' agreement ratings regarding factors that may influence the reception of peer feedback are presented in Table 1. Students appeared to be divided over the meaningfulness of anonymous peer review. Approximately 37% (52/141) of students agreed that an assessment provided by an identified peer-reviewer is more meaningful than an assessment provided by an anonymous peer-reviewer, whereas 40% (57/141) of students agreed that an assessment provided by an anonymous peer-reviewer is more meaningful than an assessment provided by an identified peer-reviewer. Approximately half of the students agreed that an assessment provided by someone with whom they do not have a personal relationship with was more meaningful than one provided by a friend, and the majority of students agreed that an assessment provided by an instructor is more meaningful than an assessment provided by a peer [82% (116/141)]. On the contrary, only 13% agreed that an assessment provided by a peer is more meaningful than an assessment provided by an instructor.

Students' agreement ratings regarding impact of peer assessment on behaviors are presented in Table 2. A high percentage of students [92% (130/141)] agreed that a positive assessment provided by a peer reinforced the behavior that was viewed positively; but only 36% (51/141) of students agreed that positive assessments provided by peers positively impact personal relationships with that peer. Most students also agreed that negative assessments provided by peers prompt change in the behavior that was viewed negatively [85% (120/141)], with only 13% (19/141) agreeing that negative assessments provided by peers negatively impact personal relationships with those peers. While 65% (91/141) of students agree that receiving peer assessments has

Table 1
Factors that may influence the reception of peer feedback ($N = 141$)^a

	Agreement, no. (%) ^b	Undecided, no. (%)	Disagreement, no. (%) ^c
1. I remember the content of assessments provided by peers	110 (78.0)	16 (11.3)	15 (10.6)
2. The assessments provided by peers about me are accurate	110 (78.0)	26 (18.4)	5 (3.5)
3. An assessment provided by an identified peer-reviewer is more meaningful to me than an assessment provided by an anonymous peer-reviewer.	52 (36.9)	34 (24.1)	55 (39.0)
4. An assessment provided by an anonymous peer-reviewer is more meaningful to me than an assessment provided by an identified peer-reviewer.	57 (40.4)	37 (26.2)	47 (33.4)
5. An assessment provided by a peer is more meaningful to me than an assessment provided by an instructor.	18 (12.7)	25 (17.7)	98 (69.5)
6. An assessment provided by an instructor is more meaningful to me than an assessment provided by a peer	116 (82.2)	19 (13.5)	6 (4.3)
7. An assessment provided by one of my friends is more meaningful to me than an assessment provided by someone with whom I don't have a personal relationship.	43 (30.5)	23 (16.3)	75 (53.2)
8. An assessment provided by someone with whom I don't have a personal relationship is more meaningful to me than an assessment provided by one of my friends.	71 (50.4)	68 (24.8)	35 (24.8)

^a Based on a 5-point Likert scale (strongly agree, agree, undecided, disagree, and strongly disagree).

^b Agreement = strongly agree + agree.

^c Disagreement = disagree + strongly disagree.

enhanced their learning, only 40% (56/141) agree that they reflect on previous assessments before starting new projects. Results showed that 58% (82/141) of students agree that receiving peer assessments has enhanced their work habits and ethics, while 24% (34/141) disagree.

Students' agreement ratings regarding impact of peer assessment on self-confidence are presented in Table 3. Approximately half of students agreed that a negative assessment provided by a peer decreased their confidence in their abilities; while 85% (120/141) of students agreed that a positive assessment provided by a peer gave them more confidence in their abilities. The majority of students agreed that peer assessments have helped to identify both

personal strengths [72% (101/141)] and future opportunities for growth [80% (113/141)].

Discussion

Previously published studies regarding peer assessment by student pharmacists have evaluated the reliability and value of peer-graded assignments,^{6,11} and perceptions of and attitudes towards the use of peer assessment during a literature evaluation course⁹ and advanced practice experience.^{7,8,10} This study differs from previous research by assessing the perceived impact of peer assessments

Table 2
Impact of peer assessment on students' behaviors ($N = 141$)^a

	Agreement, no. (%) ^b	Undecided, no. (%)	Disagreement, no. (%) ^c
1. A negative assessment provided by a peer prompts me to change the behavior that was viewed negatively	120 (85.1)	15 (10.6)	6 (4.2)
2. A positive assessment provided by a peer reinforces the behavior that was viewed positively.	130 (92.2)	9 (6.4)	2 (1.4)
3. A negative assessment provided by a peer negatively impacts my personal relationship with that person.	19 (13.4)	26 (18.4)	96 (68.1)
4. A positive assessment provided by a peer positively impacts my personal relationship with that person	51 (36.1)	28 (19.9)	62 (44)
5. I reflect on previous assessments provided by peers before starting new group projects.	56 (39.7)	24 (17)	61 (43.2)
6. Receiving peer assessments has enhanced my learning.	91 (64.6)	24 (17)	26 (18.4)
7. Receiving peer assessments has enhanced my work habits and ethics	82 (58.2)	25 (17.7)	34 (24.1)

^a Based on a 5-point Likert scale (strongly agree, agree, undecided, disagree, and strongly disagree).

^b Agreement = strongly agree + agree.

^c Disagreement = disagree + strongly disagree.

Table 3
Impact of peer assessment on students' confidence ($N = 141$)^a

	Agreement, no. (%) ^b	Undecided, no. (%)	Disagreement, no. (%) ^c
1. A negative assessment provided by a peer decreases my confidence in my abilities	69 (48.9)	19 (13.5)	53 (37.6)
2. A positive assessment provided by a peer gives me more confidence in my abilities	120 (85.1)	14 (9.9)	7 (5.0)
3. Assessments provided by my peers have helped me identify personal strengths.	101 (71.6)	20 (14.2)	20 (14.2)
4. Assessments provided by my peers have helped me identify future opportunities for growth	113 (80.2)	12 (8.5)	16 (11.3)

^a Based on a 5-point Likert scale (strongly agree, agree, undecided, disagree, and strongly disagree).

^b Agreement = strongly agree + agree.

^c Disagreement = disagree + strongly disagree.

completed throughout a professional degree curriculum. Previous research has reported that making the peer-assessment process anonymous was rated helpful by 71% of student pharmacists in completing and/or receiving peer assessment.⁹ However, in this study only 40% of students agreed that an assessment provided by an anonymous peer-reviewer is more meaningful than an assessment provided by an identified peer-reviewer. This could imply that student pharmacists are more comfortable providing constructive feedback in an anonymous fashion but are impacted more by the receipt of such feedback when they know the peer-reviewer. The results to this study are similar to previous studies in that only about one-third of students agreed that receiving a peer assessment from a friend is more helpful or meaningful than from a peer who is not a friend.⁹ We also found that peer assessments do not appear to impact personal relationships between students, whether the assessment is positive or negative.

In the qualitative study by Papinczak et al.,⁴ researchers found that positive impacts of peer assessment included improved confidence and enhanced learning via giving and receiving meaningful feedback, whereas negative perceptions of peer assessment included lack of relevancy. These concepts were confirmed with our results as the majority of the students in this study agreed that a positive assessment provided by a peer reinforced the behavior that was viewed positively, a positive assessment provided by a peer gave them more confidence in their abilities, and that receiving peer assessments has enhanced their learning. Our results are also in agreement with previous research in that the majority of student pharmacists' may not view peer assessment as a relevant activity, as less than 40% agree that they reflect on previous assessments before starting new projects.

Limitations of the study include the lack of variability in types of peer-assessment activities that students are exposed to throughout the Doctor of Pharmacy curriculum. The only type of peer assessment completed by students is written feedback in a non-anonymous fashion. While students could have participated in other forms of peer assessment (verbal, anonymous, etc.) in other courses, the exposure to these

other forms is not necessarily uniform across all students. This survey also did not assess if the type of feedback (oral vs written) impacted student pharmacists differently. The students did not receive any formal training to prepare them to provide valuable peer assessment and our survey did not assess the quality of the peer assessments. Finally, the results of this project limited by the small convenience sample of one class.

Conclusions

Results from this study indicate that receiving peer assessment is perceived by pharmacy students to positively impact learning behaviors and self-confidence. Most students agreed that receipt of feedback from an instructor is more meaningful than from a peer, but students were divided regarding the impact that anonymity and friendship have on receipt of peer assessment. Most students agreed that a negative assessment provided by a peer prompts them to change the negative behavior and that a positive assessment provided by a peer reinforces the behavior that was viewed positively. The peer-assessment process is commonly used in the didactic setting as well as continuing education and professional development; as such, its impact on student pharmacists is important. These results reinforce the positive benefits of incorporating peer assessment throughout the curriculum. Future areas to continue to explore include formal training of students to improve their ability to provide adequate peer assessment, investigating how to increase the impact that peer assessment has on student pharmacists and determining if a correlation exists between positive peer assessments and work quality.

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