RESEARCH

Impact of Instruction and Feedback on Reflective Responses during an Ambulatory Care Advanced Pharmacy Practice Experience

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Objective. To investigate whether instruction and feedback on reflective responses are beneficial in developing pharmacy students to become more reflective practitioners.

Methods. Students on an advanced pharmacy practice experience answered weekly reflection questions and were randomly assigned to either an intervention (received instruction and feedback on reflection) or control group. The final week's responses were de-identified and two blinded faculty members independently categorized them as reflective or nonreflective. The primary outcome measure was comparing the number of "reflective" responses in each group.

Results. The responses were classified as reflective in 83.3% of students in the intervention group (n=18) compared to 37.5% of the control group (n=16). The odds that the response was categorized as reflective were 8.3 times higher in the intervention group.

Conclusion. Providing instruction and feedback to students improved the likelihood that their work was reflective.

Keywords: reflection, reflective practitioner, feedback

INTRODUCTION

One of the key elements of developing as a health care professional is having the ability to be a reflective practitioner.¹⁻⁴ Being a reflective practitioner means critically evaluating experiences in practice to improve actions in the future. By initiating this process of reflection, a practitioner is more mindful of previous knowledge, the impact of tacit understandings, and has the awareness of novel approaches to patient care.⁵ A reflective practitioner will gain confidence in expertise and develop into a more competent member of the health care team.¹

Incorporating reflection into pharmacy education can foster the development of life-long learners and graduates who demonstrate patient-centered care.⁶⁻⁸ In addition, it can potentially produce graduates who are more advanced professionally, which may lead to them more readily securing employment.⁹ The Accreditation Council for Pharmacy Education (ACPE) recognizes this skill of reflective practice as being critical to the development of successful pharmacy school graduates and included it in the 2016 Standards for professional programs in pharmacy.¹⁰ Standard 3.1 describes a pharmacy

graduate's ability to problem solve and to critically evaluate varied patient care scenarios, and Standard 4.1 discusses self-awareness and reflection on personal knowledge, experiences, biases, and their impact on professional growth.¹⁰

Reflection exercises have been readily implemented into doctor of pharmacy (PharmD) curricula, but challenges and questions still need to be answered regarding the effectiveness of such activities in developing reflective practitioners.¹¹⁻¹⁴ One commonly cited difficulty with these exercises is the challenge of assessing the quality and/or level of the reflection.¹⁴ Commonly, the literature describes reflection activities compiled in a portfolio and some level of assessment and feedback given to students, typically in the form of a structured rubric that rates the general quality of the work.^{8,13} Such summative feedback is beneficial, but more specific and routine feedback targeting the assessment of the students' reflective skills may be needed to further their development as reflective practitioners. Previous research demonstrated the feasibility of using assessment measures to rate the quality of pharmacy student reflections, but did not address methods to improve the students' reflective skills.^{8,15} Thus, a paucity of data demonstrates educational methods successful in improving the reflective skills of pharmacy students when measured by validated assessment measures.

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The objective of this study was to investigate whether instruction and feedback on reflective responses completed during an ambulatory care advanced pharmacy practice experience (APPE) are beneficial in helping pharmacy students become more reflective practitioners.

METHODS

From July 2012 to April 2013, fourth-year pharmacy students at three different ambulatory APPE locations in Omaha, NE were asked to answer specific reflection questions after the first through fourth weeks of their 5-week APPE (Table 1). The students submitted answers to the weekly questions via Google Doc (Google Inc., Mountain View, CA) and shared online access to this document with their preceptor and the Creighton University School of Pharmacy and Health Profession's chaplains. The chaplains were included in this activity because of their role in the development of students' reflection abilities at the school throughout the curriculum. Reflection activities are completed most often following an experiential activity or service learning opportunity with general feedback given to students for some reflections.

Students were randomized to either the intervention group or the control group at the beginning of the APPE. Students assigned to the intervention group received specific instructions and guidance on how to compose reflective responses and also received weekly feedback on their responses to the reflection questions. The students assigned to the control group did not receive any instruction or feedback.

During the first week of the APPE, the students assigned to the intervention group attended a 1-hour session that provided them with instructions and guidance on why reflective skills are important for pharmacists to develop, what it means to be a reflective practitioner, and ways to increase the level of reflection when completing the reflection exercises. During this instruction session, the students were also presented with the categorization

scheme that would be used to assess the level of reflection of their responses. This categorization scheme was developed by Wallman et al specifically to assess pharmacy student reflections and was originally based on works of Kember and Mezirow.¹⁵⁻¹⁷ It has good interrater reliability and responsiveness to detect change as a result of an intervention.¹⁵ The scheme has six categories: (1) habitual action, (2) thoughtful action, (3) introspection, (4) content reflection, (5) process reflection, and (6) premise reflection. Categories 1-3 are "nonreflective" and 4-6 are "reflective" (Table 2). In this scheme, for a response to be determined as reflective, it must include an analysis of the situation where the actions are evaluated and the behaviors are interpreted. This definition of reflection mirrors key traits of a reflective practitioner; thus, we chose it to assess the responses.

Instruction on how to create a more reflective response included an analysis of the encounter or situation that the student was describing. To be categorized as reflective, student responses would need to assess actions and thought process during the situation and then address what students had learned from the situation and how it would impact their future practice as a pharmacist.

The three faculty preceptors and the chaplains met on a weekly basis to provide feedback on responses of students assigned to the intervention group. Each student's response was reviewed by the group and the feedback was given directly on the Google Doc for the student to view prior to the completion of the following week's response. The feedback consisted of approximately one paragraph of commentary including an overall evaluation of the response, ways to improve the response regarding the level of reflection, and guidance on how to increase the level of reflection for the next week's response.

The responses to the week 4 question were de-identified and given to two blinded pharmacy faculty members who independently categorized the level of reflection according to the scheme described above. The blinded

Table 1. Weekly Reflection Questions for the Ambulatory Care Advanced Pharmacy Practice Experience

Time Period	Reflection Questions
Week 1	Describe a situation where you provided (or someone else) care for the "whole person." How will these experiences impact how you practice pharmacy?
Week 2	What was the most significant service (in your own opinion) that you provided to another person and why? How will these experiences impact how you practice pharmacy?
Week 3	Describe how you are similar/different to those whom you interacted with in terms of race, religion, ethnicity, socioeconomic status, etc. How did these similarities/differences impact your rotation experience? How will these experiences impact how you practice pharmacy?
Week 4	What did you see or do during the practice experience that was uplifting, insightful, or inspirational? What did you see or do that was disquieting, disturbing, or problematic? How will these experiences impact how you practice pharmacy?

Table 2. Categorization Scheme for Written Responses

Response Type	Response Description
1. Habitual Action	Description of an unconscious act
2. Thoughtful Action	Previous knowledge is considered when composing the response, but no interpretation or analysis of the actions of the encounter are included
3. Introspection	Inclusion of thoughts and feelings about oneself
4. Content Reflection	Analysis of what has been done to handle a problem
5. Process Reflection	Analysis of why certain actions took place during an encounter
6. Premise Reflection	Analysis of what has happened, why it has happened, and how it will impact actions in the future
1-3: Nonreflective response	
4-6: Reflective response	

faculty members were provided with an explanation of the categorization scheme and were chosen to assess the reflections based on the breadth of their experience using reflections for their own course activities. Responses were defined as nonreflective if the consensus categorization score determined by the blinded faculty members was less than or equal to three and reflective if the score was greater than three. The primary outcome measure of the study was to compare the number of week 4 responses categorized as “reflective” in the intervention group to those of the control group.

To determine the possible impact of internal and external factors on the student reflection abilities, all students completed surveys at the beginning of the APPE prior to randomization and at the end of the APPE. The pre-APPE survey gathered information about the number of completed APPEs, student age, gender, whether or not the students had children, marital status, whether or not the students had employment confirmed after graduation, level of education prior to entering pharmacy school, profession or career prior to pharmacy school, prior education at a Jesuit institution, whether they participated in reflection activities in prior APPEs, student perception of reflection and its impact on providing pharmaceutical care, and professional development and assessment of previous instruction they had received on how to be a reflective practitioner. Following the completion of their week 4 responses, students completed the post-APPE survey, which inquired about their interactions with patients and other health care providers during the APPE and their understanding of how to be a reflective practitioner and its importance on providing pharmaceutical care and fostering professional development. Prior to the initiation of the study, the research proposal was reviewed by the Institutional Review Board of Creighton University and was approved with exempt status.

Descriptive statistics were performed on students’ demographic characteristics. Reflective responses between the intervention and the control group were compared using chi-square test and mean difference for

reflective scores was tested by independent *t* test. The interrater reliability was calculated with the Cohen kappa. Finally, logistic regression was conducted to identify factors associated with reflection after adjusting for covariates.

RESULTS

Thirty-four students were included in the analysis with 16 randomized to the control group and 18 to the intervention group. The mean age of the participants was 25 years (range 22-31 years), 62% were female, and 58.8% of the participants had completed written reflection activities on a previous APPE. Comparing the control to the intervention group, there were no significant differences regarding which APPE location the students were at, gender, marital status, or age. When asked to rate the amount of previous instruction/guidance they had received on how to be a reflective practitioner, 88.2% of the participants responded with “very little” or “some.” Thirty students (88.2%) quantified the previous amount of instruction time on developing as a reflective practitioner as five hours or fewer. At the start of the APPE, the students self-assessed their ability to reflect on their practice of pharmacy, and 32.4% indicated “needs improvement,” 55.9% “satisfactory,” and 11.8% “excellent.”

The intervention group had a significantly higher proportion of responses rated as reflective compared to the control group (Figure 1). The proportion of week 4 responses from the intervention group categorized as reflective was 83.3% compared to only 37.5% from the control group ($p=0.006$). Based on the analysis of the pre/post-APPE surveys and the study group assignment, the only factor found to have a significant effect on whether a student’s week 4 response was categorized as reflective was the assignment to the intervention group ($p=0.011$, Table 3). The odds of the response being categorized as reflective were 8.3 times higher for the intervention group ($p=0.009$, Table 4). Site location and cycle of the APPE, age, gender, marital status, whether they had children, postgraduation employment, having

Figure 1. Categorization of week 4 responses. Nonreflective response defined as categorization score of 1-3; reflective response defined as categorization score of 4-6.

a career prior to starting pharmacy school, previous training at a Jesuit institution, and previous APPE with reflection assignments did not significantly impact the probability of responses being categorized as reflective. Similarly, students' perceptions of their APPE experiences during the study (eg, number of patient encounters and interactions with patients and other health care providers) did not show any significant difference in the probability of week 4 responses being categorized as reflective. Excerpts from week 4 responses from the intervention group and the control group can be found in Appendix 1.

DISCUSSION

Pharmacists are increasingly involved in providing direct patient care in a variety of practice settings. Many of the scenarios pharmacists encounter do not have clear cut ways to address them and instead require critical analysis and ability to interpret tacit components of interaction.^{1,6} One way to develop as a professional successful in such scenarios is to practice as a reflective practitioner.^{1,14} Reflective practices have been a focus for the training of other health care professionals and only more recently have become a key component in the curriculum for pharmacy students.¹⁰ One cited shortcoming of the current use of reflection activities in pharmacy curricula is

the challenge of assessment.¹⁴ There is a need for tools to assess reflection abilities of pharmacy students and to provide direction on how the students can further develop as reflective practitioners.

This study demonstrated that one potential way to further develop the reflective abilities of a pharmacy student is through specific instruction and feedback. Most students who participated in this study reported having little previous instruction on reflection, and it was clear that students randomized to the intervention group who were exposed to such direction were able to surpass their counterparts in the control group in composing truly reflective responses. To improve reflective skills of future practitioners, reflection activities need to go beyond asking students to merely talk about an experience. Rather, students need to be specifically instructed on how to analyze a situation they encounter in practice and how to utilize what they learn from that experience to improve the way they practice pharmacy.^{5,18,19} As with all other areas of pharmacy coursework, for the students to continue to develop reflective skills, they must be given feedback on how they can improve and specifically on how they can think more like a reflective practitioner.

Instruction and feedback for students in the intervention group were provided by a group of faculty members and two chaplains, but such a large group is not necessary to provide adequate instruction and feedback in general.¹⁵ As time progressed throughout the study, the faculty members became more competent in providing direction to students and, since completion of the study, have individually provided such guidance to APPE students for reflection activities. The amount of time required to provide this feedback was relatively small, but the impact was impressive. Similar to other examples of evaluation of reflection responses, typically less than five minutes per student was needed.¹⁵ This type of intervention can readily be done by an individual with a vested interest in advancing students' reflective skills.

Prior to randomization, a majority of the students self-assessed their ability to be reflective as either "satisfactory" or "excellent." Based on the evaluations of the week 4 responses, many students may have overestimated their abilities or may not have truly understood what it means to be reflective. As most had previously received little instruction on reflection, they may not have understood the difference between reporting what happened during an encounter (nonreflective) vs analyzing that experience to improve themselves as practitioners (reflective). To develop more reflective practitioners, emphasis needs to be placed on instructing students on the components of a reflective response and continuing feedback to further this skill.^{5,18,19}

Table 3. Student Characteristics and Association with Categorization of Week 4 Responses

	Reflective No. (%)	Nonreflective No. (%)	<i>p</i>
Group			
Control	6 (37.5)	10 (62.5)	
Intervention	15 (83.3)	3 (16.7)	0.01
APPE Site Location ^a			
1	9 (75)	3 (25)	0.70
2	4 (44.4)	5 (55.6)	0.73
3	8 (61.5)	5 (38.5)	0.56
APPE Cycle ^b			
2	2 (50)	2 (50)	
3	4 (80)	1 (20)	
4	1 (50)	1 (50)	
5	3 (50)	3 (50)	
6	4 (66.7)	2 (33.3)	
7	3 (50)	3 (50)	
8	4 (80)	1 (20)	0.26
Gender			
Female	16 (76.2)	5 (23.8)	
Male	5 (38.5)	8 (61.5)	0.14
Married			
Yes	3 (60)	2 (40)	
No	18 (62.1)	11 (37.9)	0.50
Children			
Yes	1 (50)	1 (50)	
No	20 (62.5)	12 (37.5)	0.99
Employment Secured			
Yes	21 (65.6)	11 (34.4)	
No	0 (0)	2 (100)	0.99
Previous Career			
Yes	20 (62.5)	12 (37.5)	
No	1 (50)	1 (50)	0.99
Previous Training at a Jesuit School			
Yes	14 (73.7)	5 (26.3)	
No	7 (46.7)	8 (53.3)	0.98
Previous APPE Reflection Activities			
Yes	13 (65)	7 (35)	
No	8 (57.1)	6 (42.9)	0.81
Amount of Previous Instruction			
None	1 (4.8)	3 (23.1)	
Very little	9 (42.9)	5 (38.4)	
Some	11 (52.4)	5 (38.4)	0.27
Quantity of Previous Instruction			
Less than 1 hour	10 (47.6)	5 (38.4)	
1 to 5 hours	8 (38.1)	7 (53.8)	
6 to 10 hours	3 (14.3)	1 (7.7)	0.64

APPE=advanced pharmacy practice experience

^aAPPE site locations were three family medicine clinics located in Omaha, Nebraska

^bAPPE Cycle refers to the time period during the school year that the students participated in the project (Cycle 2 being the second APPE of the year and Cycle 8 being the last APPE prior to graduation)

Despite the success of the intervention, there are limitations to this study. One of the main limitations is the low number of students participating in the study. This study was designed to investigate potential ways to

increase the reflective abilities of students and needs to be validated by a larger study group to confirm the results. As there was no way to blind students to their group assignment, it is possible that this biased the way students

Table 4. Multiple Logistic Regression Analysis for the Likelihood of Response being Categorized as “Reflective”

Variable	Beta (SE)	Wald Statistic	p	Odds Ratio	95% CI
Group	2.12 (0.82)	6.74	0.01	8.33	1.68 - 41.29
Constant	-0.51 (0.52)	0.98	0.32		

SE=standard error, CI=confidence interval

performed on the week 4 responses. Potentially, knowing that their responses were going to be more critically evaluated during the APPE, students in the intervention group may have put more effort into the activity, which resulted in more reflective responses in week 4. Though the categorization scheme used to rate the responses was evaluated previously for reliability, feasibility, and responsiveness, further validation of the tool is needed.¹⁵ A larger study needs to be completed to confirm its validity. Lastly, the interrater reliability measured by the Cohen kappa was -0.083 ($p=0.57$), which could indicate that the agreement in the response categorization between the two blinded faculty members categorizing the responses was worse than expected. However, the p value was not significant and may have been a result of random error given the small study sample size.

CONCLUSION

Providing instruction and feedback to students on how to be a reflective practitioner and specifically on how to compose a reflective response increased the likelihood of their response being categorized as reflective. To develop the reflective skills of future practitioners, emphasis needs to be placed on the instruction, assessment, and feedback on reflective activities.

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REFERENCES

1. Droege M. The role of reflective practice in pharmacy. *Education for Health*. 2003;1(16):68-74.
2. Hill LH, Kirkwood CK. Student and preceptor perception of performance in advanced pharmacy practice experiences. *Am J Pharm Educ*. 2005;69(4):Article 63.

3. Kansanaho H, Cordina M, Puumalainen I, Airaksinen M. Practicing pharmacists' patient counseling skills in the context of reflectivity. *Pharm Educ*. 2005;5(1):19-26.
4. Brown D, Ferrill MJ. The taxonomy of professionalism: reframing the academic pursuit of professional development. *Am J Pharm Educ*. 2009;73(4):Article 68.
5. Epstein RM. Mindful practice. *JAMA*. 1999;282(9):833-839.
6. Sanchez AM. Teaching patient-centered care to pharmacy students. *Int J Clin Pharm*. 2011;33(1):55-57.
7. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *Am J Hosp Pharm*. 1990;47(3):533-543.
8. Briceland LL, Hamilton RA. Electronic reflective student portfolios to demonstrate achievement of ability-based outcomes during advanced pharmacy practice experiences. *Am J Pharm Educ*. 2010;74(5):Article 79.
9. Wallman A, Lindblad A, Gustavsson M, Ring L. Factors associated with reflection among students after an advanced pharmacy practice experience (APPE) in Sweden. *Am J Pharm Educ*. 2009;73(6):Article 107.
10. Accreditation Council for Pharmacy Education. Accreditation standards and key elements for the professional program in pharmacy leading to the doctor of pharmacy degree. The Accreditation Council for Pharmacy Education Inc., 2015. <https://www.acpe-accredit.org/standards/>.
11. Hogg G, Ker J, Stewart F. Over the counter clinical skills for pharmacists. *Clin Teach*. 2011;8(2):109-113.
12. Plaza CM, Draugalis JR, Slack MK, Skrepnek GH, Sauer KA. Use of reflective portfolios in health sciences education. *Am J Pharm Educ*. 2007;71(2):Article 34.
13. Dawn S, Smith MJ, Peterson S, et al. Electronic portfolios: questions, implementation, and lessons learned in a doctor of pharmacy program. *Curr Pharm Teach Learn*. 2011;3(3):164-170.
14. Tsingos C, Bosnic-Anticevich S, Smith L. Reflective practice and its implications of pharmacy education. *Am J Pharm Educ*. 2014;78(1):Article 18.
15. Wallman A, Lindblad AK, Hall S, Lundmark A, Ring L. A categorization scheme for assessing pharmacy students' levels of reflection during internships. *Am J Pharm Educ*. 2008;72(1):Article 5.
16. Kember D, Jones A, Loke A, et al. Determining the level of reflective thinking from students' written journals using a coding scheme based on the work of Mezirow. *Int J Lifelong Educ*. 1999;18(1):18-30.
17. Mezirow J. *Transformative Dimensions of Adult Learning*. San Francisco, CA: Jossey-Bass; 1991:104-111.
18. Butani L, Blankenburg R, Long M. Stimulating reflective practice among your learners. *Pediatrics*. 2013;131(2):204-206.
19. Donaghy M, Morss K. An evaluation of a framework for facilitating and assessing physiotherapy students' reflection on practice. *Physiother Theory Pract*. 2007;23(2):83-94.

Appendix 1. Excerpts from the Week 4 Responses to a Set of Questions:

What did you see or do during your Ambulatory Care Advanced Pharmacy Practice Experience (APPE) that was uplifting, insightful, or inspirational?

What did you see or do during the APPE that was disquieting, disturbing, or problematic?

How will these experiences impact how you practice pharmacy?

Intervention Group Example:

Interestingly enough, I think that the same experience that uplifted me the most on this rotation was also the experience that troubled me the most. I met a patient with such a sad story- a wife with early onset Alzheimer's disease who did not recognize her husband anymore. I sat with him as he told his story and cried and I cried right along with him. Usually, there is some past experience I can call upon to relate to what a patient may be feeling, but that was part of the troubling part of this situation. I know that I have not experienced anything similar to what this man is going through. I assume he was feeling hopeless, sad, and missing his wife tremendously, but I can only imagine. I can relate to sadness over lost love and the anguish of losing one that you love, but not in this way. Due in part to this, I felt helpless to comfort him. I am used to being relatively good at comforting people, but I felt useless and troubled because I had no experience from which to pull comfort-sharing words.

In the future, this will remind me that while drawing on my own past experiences may help patients, they can also help me by reminding me not to take anything for granted.

The same man was also quite inspiring in the way that he cared for his wife. Despite the fact that she doesn't know him anymore, he visited her every day for breakfast. It seemed like each time broke his heart anew, but he went anyway. Hearing this, I felt humbled by the lack of care I may have shown to loved ones, as well as inspired and reminded how selfless love can be.

I would like to hang this man's story up in my pharmacy to remind me every day that each patient, Alzheimer's or otherwise, is someone's wife/husband/brother/sister/mother/father, etc. and deserves to be treated with kindness and selflessness. In the future, I want to take every extra effort, even if it costs me a bit of time or annoyance, to put in that extra effort to check interactions one more time, fill out patient-assistance paperwork, or call a prescriber's office to answer a patient's question. I want to end each day with the satisfaction that I did all I could to care for someone's wife/husband/brother/sister/mother/father, etc. that day.

Control Group Example:

I really enjoyed working with the physicians, I also really like the aspect of ambulatory because of the continuity of care. You get to know your patients and build a relationship with them. It's always important to remember that our patients are also people. I will always try to treat everyone with respect and try to understand them. Compassion and empathy is something that I have learned in all my rotations and I know these skills will make me a better pharmacist.