

INSTRUCTIONAL DESIGN AND ASSESSMENT

Assessing Empathy and Self-Efficacy Levels of Pharmacy Students in an Elective Diabetes Management Course

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Objective. To assess the impact of a 6-week patient/provider interaction simulation on empathy and self-efficacy levels of diabetes management skills in third-year pharmacy students.

Design. Pharmacy students enrolled in a diabetes elective course were paired to act as a patient with diabetes or as a provider assisting in the management of that patient during a 6-week simulation activity. After 3 weeks, students switched roles. The simulation was designed with activities to build empathy.

Assessment. The Jefferson Scale of Empathy (JSE) and a self-efficacy survey were administered to assess change in empathy and confidence levels from baseline to the end of the activity. Completion of the activity resulted in significant improvement in total JSE scores. Additionally, significant improvements in overall self-efficacy scores regarding diabetes management were noted.

Conclusion. The 6-week patient/provider interaction simulation improved empathy and self-efficacy levels in third-year pharmacy students.

Keywords: diabetes, self-efficacy, empathy, student pharmacist

INTRODUCTION

The Center for the Advancement of Pharmacy Education (CAPE) Educational Outcomes 2013 include patient-centered care as a core educational outcome for student pharmacists.¹ Patient-centered care requires collecting and interpreting evidence, prioritizing and formulating assessments, and recommending, implementing, monitoring, adjusting, and documenting plans. In didactic pharmacy curriculum, students receive key information in the form of cases and scenarios. In the real world, this information must be obtained from patient charts and through communication with patients, their caregivers, and other health care providers.

Communication is also outlined in the CAPE Outcomes.¹ Effective communication requires that students ask organized, open-ended questions, actively listen, build trust, and demonstrate empathy. Effective interpersonal interactions with patients are essential to building trust. Empathy as part of communication with patients in the health care setting significantly improves patient satisfaction and compliance.² As Theodore Roosevelt said, "People don't care how much you know until they know how much you care."

In traditional didactic pharmacy courses, students may practice principles of patient-centered care; however, they may not have the opportunity to incorporate communication with patients—an essential information gathering component of patient-centered care—into their training. Combining communication and patient-centered care skills traditionally occurs in experiential courses, using real and standardized patients and simulations.³ Empathy is measured in multiple ways in health professionals and health professions students.⁴ Tools exist for students and professionals to rate themselves, for patients to rate providers, and for observers to rate interactions between health care professionals and patients. Tools for first-person assessment appear most often in the literature evaluating validity and reliability. The JSE is a first-person assessment designed to evaluate health care providers in patient care situations.⁵ This 20-item evaluation is scored on a scale from 1 (strongly disagree) to 7 (strongly agree) and includes space for positive and negative statements. It assesses empathetic qualities and tendencies in health care students and professionals and has been evaluated for validity and reliability. Among student pharmacists, the JSE is used to evaluate empathy in various ways.⁶⁻⁹ Chen and colleagues evaluated 26 students in their fourth professional year, who completed a 10-day simulation of the life of a patient with multiple chronic diseases during an advanced pharmacy practice

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experience (APPE). Students were assessed with the JSE presimulation and postsimulation. Scores improved from 114 presimulation to 119.6 postsimulation.⁶ Kiersma and colleagues assessed students in their second professional year with the JSE before and after participating in an aging simulation game. Empathy scores increased from the pre-assessment to the post assessment; however, total scores were not reported.⁷ Wilson and colleagues assessed empathy of pharmacy, nursing, and law students in their first and third professional years. They found pharmacy and nursing students from both years had higher levels of empathy compared to law students, and third-year pharmacy students had higher total empathy scores (110.4) compared to first-year pharmacy students (100.3).⁸ Van Winkle and colleagues evaluated the change in pharmacy and medical students' empathy before and after participating in a 40-minute workshop on aging. Total empathy scores improved from the preassessment (110.9) to the postassessment, measured immediately following the workshop (113.2); however, the scores decreased when they were assessed again 7 or 26 days later (110.5).⁹ While the JSE is used to assess empathy change in student pharmacists, factors such as prescores and postscores, professional level of students, and simulation activities have varied in the reports.

This paper describes a didactic course that incorporated a learning activity in which students acted as patients and as providers to practice communication and patient-centered care principles. Student self-efficacy and empathy before and after the activity were assessed using the JSE.

DESIGN

Diabetes Care and Experience was a 3-credit elective course that met 3 hours per week for 15 weeks. Students were able to take this elective during the third professional year in a traditional 4-year professional program after they successfully completed the required endocrine and cardiovascular pharmacotherapeutic courses. The elective course enrolled a maximum of 30 students in each offering. The course material was meant to extend the

foundational content students learned in the pharmacotherapeutics courses and to enhance knowledge of social aspects and more advanced clinical considerations in diabetes management. The material presented during the first 7 weeks of the 15-week course consisted of evidence-based medicine approaches to treating hyperglycemia, diabetes-associated complications, special populations, medical nutritional therapy, educating adult learners and understanding their cultural competency issues, and motivational interviewing techniques. During these 7 weeks, multiple active-learning strategies were utilized to apply all content material. Providing these advanced management topics in the first 7 weeks of the course was intended to prepare students for the simulation activity during weeks 8 through 13. The patient/provider interaction simulation activity randomly paired students, with one assigned the role of patient and the other, clinical pharmacist provider. They assumed the assigned role for 3 consecutive weeks then switched roles and partners to extend interactions with other students in the course. The patient/provider interaction simulation activity had weekly points assigned, and the overall activity was worth approximately 20% of the course grade. Table 1 describes the activities and points allotted. Rubrics were designed for each activity. Throughout the rest of this article, the terms "patient" and "provider" describe those student roles. The term "interaction activity" refers to the patient/provider interaction simulation activity. A graphical representation of the activity is displayed in Figure 1.

The goal of the patient role was to enhance student empathy when treating patients with diabetes. During the 3 weeks students assumed the patient role, they were encouraged to follow an appropriate diet that met all nutritional requirements for patients with diabetes, to take prescribed (placebo) medications, to test blood sugars at least twice per day or per the recommendation of their provider, to experience simulated disease progression, and to complete sampled empathy exercises. Table 2 describes example empathy exercises, of which students were required to complete a minimum of 4.

Table 1. Assessment Points for Patient/Provider Interaction Simulation Activity

	Patient Activity (points)	Provider Activity (points)
Week 1	Journaling/Discussion (20) Obtain blood glucose values (20)	SOAP note (25)
Week 2	Journaling/Discussion (20) Obtain blood glucose values (10)	SOAP note (25) Drug Information Response (10)
Week 3	Journaling/Discussion (20) Administration of Insulin (10)	SOAP note (25) Self-evaluation of recorded interview interactions (15)
TOTAL	Points for Patient (100)	Points for Provider (100)

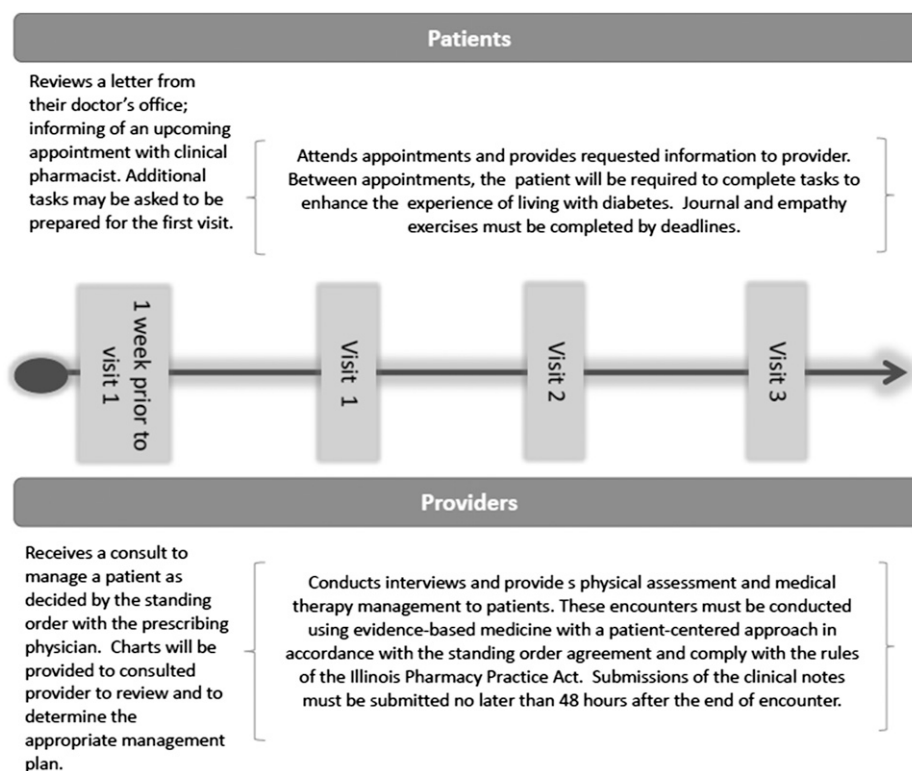


Figure 1. Graphical representation of the patient/provider interaction simulation activity

The week prior to the interaction activity, patients were provided with a backpack that included all diabetes testing supplies, empathy exercise supplies, medications (including oral and injectable placebo), and a background patient history data form. The data form had information pertinent to the patient role (past medical history, surgical history, insurance provider information, preferred pharmacy information, consulting physician, medication lists, and a chief concern for each encounter). If specific information was not provided, the patient could ad lib as it would not affect how the coordinator intended the case to progress; however, the provider would have to adjust rec-

ommendations based on the information disclosed during the appointment. For follow-up appointments, patients received a reminder e-mail that included their scheduled appointment time, new chief concerns, and a medication list. At times the patient’s medication list on paper did not coincide with the chart medication list as a result of the case progression aspect of this interaction activity. This was intended to force the provider to conduct appropriate medication reconciliation during each appointment and develop a plan prior to the end of each appointment.

The goal of the provider role was to increase self-efficacy in diabetes management, interviewing, and

Table 2. Empathy Exercises for Students in the Patient Role of the Interaction Simulation Activity

Purchase a 10-pack of syringes from local pharmacy and document how pharmacy staff treated you.
Tape fingers together and test blood sugar to experience dexterity issues.**
Develop and follow an exercise plan for 3 days, test your blood glucose before, immediately after, then 2 hours after to evaluate how exercise has an effect on glucose levels.
Contact the glucose meter company to discuss a meter error code and reflect upon the interaction with the company representative.
Call a diabetes patient education program offered by local institutions and reflect on how a patient would select an education program by comparing and contrasting programs; provide details of individual programs.
Cover provided goggles with Vaseline and watch your favorite television show for 30 minutes or draw up your insulin and test your blood sugars at that time; describe your experience.**
Prepare one recipe claiming to be diabetes-friendly and evaluate taste and difficulty of making the meal.
Place sugar, alcohol, or lotion on your hands, obtain a blood glucose sample and document noted differences in the reported values.

** = indicates mandatory exercises for all student patients to complete

counseling skills. Students retained the role of the provider for 3 consecutive weeks. One week prior to role assignment, the collaborative practice agreement/standing order set from the consulting physician and the patient's electronic medical record were sent to the provider for review. Providers were also given a backpack—theirs included a sphygmomanometer, stethoscope, monofilament, and placebo sample medication devices to train patients in the event they needed to prescribe these products. The initial appointment was 1 hour in length followed by 2 weekly 30-minute follow-up appointments. These appointments were scheduled during the first hour of in-class time. The follow-up appointments illustrated progression of patient disease state of anywhere between 2 weeks to 10 years. After each appointment, the provider was responsible for completing all of the clinical documentation necessary for the interaction activity, including subjective, objective, assessment and plan documentation (SOAP notes), new prescriptions, updated medication reconciliation sheets, orders for requested labs, provision of immunizations, if applicable, and schedule for the follow-up appointment. Providers were required to submit the SOAP notes to the consulting physician within 48 hours, as described in the Illinois Pharmacy Practice Act, to hold the provider accountable to normal practice standards.

After submitting documentation, the consulting physicians (ie, the elective course instructors) reviewed the documentation, completed the grading rubric each week for SOAP notes and contacted the provider to indicate acceptance of recommendations. If recommendations were not accepted, another plan had to be developed by the provider and submitted. If the patient was harmed, the provider had to call the patient within a given timeframe (specific to the circumstance and determined by the consulting physician) to inform the patient of any changes. Providers were required to use Kall8, a toll free number that was created specifically for this interaction activity to verify that specific communication occurred between the provider and the patient or consulting physician.

In addition to the clinical documentation for each encounter, two additional activities were required of providers. They were responsible for reviewing their audio-taped sessions and providing a reflection on their interactions, in which they were to reflect on their verbal communication skills to assess delivery of the medical information provided, the level of empowerment they provided to the patient, and the presentation of a patient-centered approach. Providers also received a drug information question from their consulting physician related to their specific patient case or another patient case. Students would have up to 5 days to respond to the request. Providers were required to use the Kall8 phone number to report drug information responses.

The goal of including a consulting physician role was to provide students with an opportunity to communicate with a health care professional they would share patient care responsibilities with. This role was played by 2 faculty members from the school of pharmacy who were involved with the elective course and who had practice experience in a diabetes care clinic. Students were blinded to which faculty member served in this role. The consulting physician created the standing order set followed by the provider and was responsible for releasing patient medical records communicating with the provider on a weekly basis. After each appointment and review of the submitted SOAP note, the consulting physician was responsible for accepting or rejecting the medical management plan and completing the SOAP note rubric. The consulting physician was also responsible for grading the drug information response and the self-evaluation of recorded interactions. Grading of all SOAP notes and other activities was conducted by one clinical faculty member and then reviewed by the other to limit subjectivity. During each cycle, a total of 3 to 4 cases were used. Consulting physicians would accept recommendations as long as there was no harm to the patient and the rationale of the plan was evidence-based and patient-centered.

The course coordinator also acted as the “community pharmacist” for the patients and as the “APPE preceptor” for the providers immediately following each appointment. Providers educated patients on the plan decided upon during appointments and provided prescriptions to patients. After the appointment, patients went to the simulated pharmacy located in the classroom, where the coordinator assumed the role of the community pharmacist. At that time, the coordinator questioned the patient regarding the education provided to ensure the patient understood the new treatment plan. As the APPE preceptor, the coordinator questioned the provider's rationale and plan selection. This was done in real time to allow the provider to become more comfortable with time-sensitive decisions. It also limited changes in plans after the appointment and prior to SOAP note submission.

It was estimated that between the 2 faculty members, 40 hours of time was needed during the 6-week exercise. This time commitment consisted of preparing the cases, sending out e-mails to patients and providers on a weekly basis, and weekly grading. Faculty members had to return feedback to providers within 48 hours. They also arranged yearly donations for glucose meters, strips, syringes, alcohol pads, and vials and secured the upfront cost of \$500.00 to purchase 20 audio-recording devices, sphygmomanometers, backpacks, monofilaments, and candy (placebo).

The Health Professional (HP) version of the JSE is a validated tool to assess empathy in health professionals.

This version was selected because the student providers were conducting the intervention in the role of a provider. This tool uses a Likert Scale with 7 possible responses (1=Strongly Disagree through 7=Strongly Agree) for twenty questions. Both positive and negative statements are included. Scores for negative statements are reversed and the total of all responses are added for a total score. Scores should only be included if the respondent answered at least 16 (80%) of the questions. The higher the score, the more empathetic the individuals may be towards their patients and disease states. Total scores may range from 20 to 140.

The self-efficacy survey (Figure 2) was designed for students to rate their confidence in performing 25 separate activities on a Likert Scale (1=strongly disagree and 5=strongly agree). The questions were divided into 4 sections: interview structure and physical examination, lifestyle management, evidence-based approach and drug therapy management, and education. The survey questions were created based on the course objectives.

Each student enrolled in the diabetes elective course in 2012 and 2013 was asked to complete the JSE and

a self-efficacy survey before and after the 6-week patient/provider interaction activity. Mean scores were reported and compared using a paired *t* test for both the JSE and self-efficacy studies. This study was approved by the Southern Illinois University Edwardsville Institutional Review Board. Informed consent was obtained from each student. Students included a study identifier on each survey in order to link the presurveys and postsurveys.

EVALUATION AND ASSESSMENT

Only surveys with a matching presurvey and post-survey identifier and completion of at least 80% of the questions on each survey were included in the analysis. Twenty-two surveys were completed from a class of 24 students in 2012 and 26 surveys were completed from a class of 30 students in 2013 for a total survey response rate of 89% (48 out of 54). The total scores on the JSE over the 6-week interaction significantly increased from an average of 114 (9.4) to 123 (10.1) ($p < 0.001$). Students showed a significant improvement in self-efficacy scores with an increase in the overall average from 3.6 to

Unique Identifier: _____

Answer this survey prior to the start of the patient/provider encounter interaction utilizing the below Likert-scale to assess your confidence in the below items (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree)

I feel confident...					
Interview structure / physical examination					
1	conducting an initial (first time/new) patient interview.	1	2	3	4 5
2	conducting a follow-up patient interview.	1	2	3	4 5
3	motivating my patient to be adherent with their diabetes medicinal therapy.	1	2	3	4 5
4	motivating my patient to be adherent with lifestyle modifications.	1	2	3	4 5
5	completing a foot exam, including visual and monofilament components.	1	2	3	4 5
Lifestyle management					
6	recommending an exercise routine for a patient with diabetes (assuming clearance from a cardiologist/primary care provider is given).	1	2	3	4 5
7	recommending a proper diet meeting the recommended consumption for a person with diabetes (medical nutritional therapy).	1	2	3	4 5
Evidence-based approach and drug therapy management					
8	utilizing the chart to review labs and pertinent information in order to assess current status of diabetes.	1	2	3	4 5
9	using guidelines to support the next step in diabetes management for a given patient.	1	2	3	4 5
10	using guidelines to support the next step in hypertension management for a given patient.	1	2	3	4 5
11	using guidelines to support the next step in hyperlipidemia management for a given patient.	1	2	3	4 5
12	making sound recommendations to another health care provider, particularly the consulting provider of a given patient.	1	2	3	4 5
13	identifying patient specific contraindications or precautions for oral therapies.	1	2	3	4 5
14	identifying patient specific contraindications or precautions for incretin therapies (DPP4-inhibitors or GLP-1 agonists).	1	2	3	4 5
15	identifying signs and symptoms of hypoglycemia when provided by patient.	1	2	3	4 5
16	assessing medication adherence with a given patient.	1	2	3	4 5
17	identifying diabetes-related medication problems.	1	2	3	4 5
Education					
18	counseling the patient on what to expect while on a sulfonylurea.	1	2	3	4 5
19	counseling the patient on what to expect while on metformin.	1	2	3	4 5
20	counseling the patient on what to expect while on a DPP4-inhibitor.	1	2	3	4 5
21	counseling the patient on what to expect while on a GLP-1 agonist.	1	2	3	4 5
22	counseling the patient on what to expect while on insulin.	1	2	3	4 5
23	counseling on the administration of insulin (purpose, injection technique, and mixing of insulin).	1	2	3	4 5
24	counseling a patient on proper signs and symptoms of hypoglycemia.	1	2	3	4 5
25	counseling on appropriate treatment of hypoglycemic reactions.	1	2	3	4 5

Figure 2. Patient/Provider Encounter Interaction Survey

4.3 ($p < 0.001$). Each of the 4 survey sections also significantly improved in average scores as shown in Table 3.

In addition to the Likert-scale questions regarding empathy and self-efficacy, students were asked to provide comments about their experiences during this 6-week simulation. Comments were positive in that all students reported believing they were better prepared for their practice experiences. Students felt they benefited from writing SOAP notes and directly correlated their success with recommendation acceptances and improvement in these skills. Students also felt more comfortable with their interviewing skills after the weekly appointments. Students in both patient and provider roles appreciated the longitudinal design of the study. Specifically from the standpoint of the provider role, they reported being able to see how their interventions impacted patient outcomes. All students expressed the wish that more experiences like this activity were used throughout the didactic experience to help them prepare for the clinical environment that pharmacy is progressing toward.

DISCUSSION

This study showed students' self-efficacy in diabetes management and empathy toward patients improved following the interaction activity. Students' confidence in their ability to manage patients with diabetes increased in all areas, but especially in patient interviewing and physical examination. Our results are consistent with other studies that have evaluated empathy and self-efficacy of diabetes management and other health topics by delivery method of simulation.⁹⁻¹² Hojat et al evaluated the clinical outcomes of patients with diabetes who were sent to 29 family medicine physicians. The physicians were given the JSE and were grouped based on their level of empathy. Patients followed by providers with high empathy scores (scores of 129-137) were more likely to have better control of their diabetes compared to patients being seen by physicians with low empathy scores (scores of 103-117).¹³ In our study, students' empathy scores before the interaction activity would have been classified as low empathy. While the scores after the interaction

activity did not reach the high range, the scores did advance out of the low range. The results from this study are also similar to findings from Chen et al. In their study, students' presimulation empathy resulted in a total score of 114 and totaled 119 in the postsimulation assessment.⁶

Comments from patients in the interaction activity suggested that students better understood what a patient with diabetes, or any other chronic health condition, has to go through. As expressed by one student comment: "Sometimes medications are just not the patients' priority and they just need strong encouragement or motivation to help them get to the next level in bettering their health." Students had spent the last 3 years in class learning the guidelines, but had not been exposed to how impactful the patient-centered approach is. This experience attempted to open the students' eyes regarding patients who endure a daily life of multiple injections, intense lifestyle modification, and multiple oral medications. Based on student comments, students will be more likely to empathize with patients when recommending therapy.

Simulation activities may help prepare students for clinical scenarios, but they are not real-world practice. The investigators of this study feel that more realistic interactions occurred in this study compared to case scenarios on paper because students in the provider role had opportunities to communicate with the consulting physician, were held to the rigors of the Illinois Pharmacy Practice Act, and experienced discrepancies in medical records, medication lists, and vaccination lists. Students were assessed over a total time period of 6 weeks from preassessment to postassessment for both the self-efficacy and the JSE questionnaire. It is unknown if empathy could truly be gained during this time period or whether empathy was influenced by external factors. This was a graded assignment where all students enrolled knew they would be assessed on activities related to empathy and self-efficacy, which may have contributed to a greater response toward empathy and self-efficacy in the surveys. This study was not conducted with a control group, which could have limited the ability to determine if the interaction activity truly influenced the students' empathy and

Table 3. Average Scores from Pre/Post Self-efficacy Surveys (n=48)

	Preencounter Mean (SD)	Postencounter Mean (SD)	p value
Section 1: Patient Interviewing/Physical Examination	3.1 (0.67)	4.2 (0.53)	<0.001
Section 2: Lifestyle Management	3.3 (0.40)	4.3 (0.29)	<0.001
Section 3: Drug Therapy Management	3.7 (0.61)	4.4 (0.51)	<0.001
Section 4: Education	3.7 (0.59)	4.5 (0.49)	<0.001
Overall Mean Scores	3.6 (0.74)	4.3 (0.59)	<0.001
Average Total Score	89	107	<0.001

self-efficacy. Finally, sustained effects on empathy and self-efficacy were not measured.

SUMMARY

The results of this study suggest that the patient/provider interaction activity used in a diabetes elective course is an effective way to help improve students' self-efficacy in disease state management and their empathy towards patients. Similar methods or the incorporations of additional disease states in the exercise could be used to further improve student learning and empathy toward patients.

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