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Assessment of an Innovative Medication Adherence Training Exercise in an Interprofessional Training Program

Ashley L. Adams PharmD, MS *Sells Hospital*

Megan Gregory PhD *Michael E. DeBakey The Ohio State University*

Sonya R. Wilmer PharmD, BCPS *Michael E. DeBakey VA Medical Center*

Natalie Hundt PhD *Michael E. DeBakey VA Medical Center, Baylor College of Medicine*

Abstract

Objective To assess the effect of an innovative training exercise on post-graduate healthcare trainees' knowledge and perspectives of medication adherence and skills gained within an interprofessional training program. **Methods** Post-graduate trainees (medicine, pharmacy, advanced practice nursing, and mental health) at the Michael E. DeBakey VA Medical Center's Center of Excellence in Primary Care Education interprofessional training program participated in a medication adherence exercise and training session. The session included a formal PowerPoint presentation, an innovative medication adherence simulation exercise, clinical scenarios, and a journal club. Verbal feedback during the debriefing session occurred after the medication adherence simulation exercise and throughout the session. **Results** Six trainees participated in the exercise and training session (2 medical residents, 2 nurse practitioner residents, 1 pharmacy resident, and 1 clinical psychology fellow). Trainees reported developing a greater understanding for barriers patients face with medication adherence, empathy, and strategies to manage patients' medication adherence. **Conclusions** The medication adherence exercise and training session provided an opportunity for healthcare professionals from different professions to discuss medication adherence and share their educational training and previous clinical experiences within an interprofessional training program.

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Introduction

Adherence is defined as “the extent to which a patient’s behavior (in terms of taking medication, following a diet, modifying habits, or attending clinics) coincides with medical or health advice” (Medication Adherence Clinical Reference, 2011). Medication nonadherence is a major issue within healthcare. Nonadherence to medication in the United States is estimated to cause approximately 125,000 deaths, at least 10% of hospitalizations, and a substantial increase in morbidity and mortality (Medication Adherence Clinical Reference, 2011; Peterson, Takiya, & Finley, 2003; Haynes, Ackloo, & Sahota, 2008). As many as 20-30% of medication prescriptions are never filled and 50% of medications for chronic diseases are not taken as prescribed (Peterson, Takiya, & Finley, 2003; Haynes, Ackloo, & Sahota, 2008; Fischer, Stedman, Lii, Vogeli, Shrank, Brookhart, & Weissman, 2010).

Adherence to medications can be affected by many factors, including health-system factors, condition-related factors, patient-related factors, therapy-related factors, and social/economic factors. As such, there have been numerous strategies to facilitate and encourage improved medication adherence. One of them is the acronym, “SIMPLE” (simplify the regimen, impart knowledge, modify patient beliefs and behaviors, provide communication and trust, leave the bias, and evaluate adherence), which is a useful mnemonic for healthcare providers when providing medication education. Script Your Future (<http://www.scriptyourfuture.org/>) is another tool, which is a website that provides medication adherence resources for healthcare providers and patients (Medication Adherence Clinical Reference, 2011; Script Your Future, 2017).

Medication adherence affects all healthcare professions with each having their own learning strategies and techniques to teach students, residents, and fellows. Previous research has examined methods and formal education activities to teach students the importance of medication adherence. For example, Ulbrich and colleagues developed a simulated medication regimen with Starburst jellybeans for pharmacy students over a one-week timeframe (Ulbrich, Hamer, & Lehotsky, 2012). Divine and Cain implemented a 10-day medication adherence project where health professional students (99% pharmacy students) received six “medi-

cations” consisting of demonstration inhalers and small candies (Divine & Cain, 2009). Darbishire and colleagues also evaluated a similar medication simulation activity over a two week period with and without an automated medication dispenser (Darbishire, Plake, Kiersma, & White, 2012). Students then used their knowledge of the automated medication dispenser to identify patients during their experiential rotations who would benefit from the automated medication dispenser and educate the selected patients about the features of the dispenser for use. These simulation activities developed empathy, improved student confidence, and increased awareness of difficulties that are encountered by patients with medication adherence.

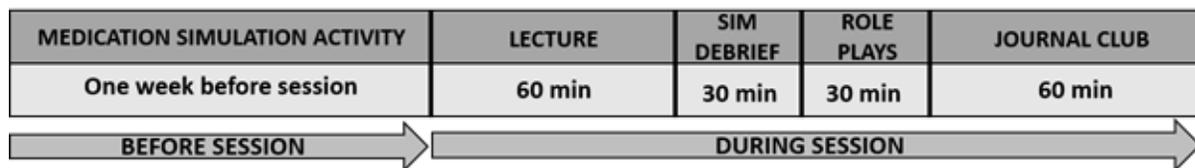
At the Michael E. DeBakey VA Medical Center, a curriculum was developed as part of an interprofessional training program called the Center of Excellence in Primary Care Education (CoEPCE). This program was funded by the Veterans Health Administration and Office of Academic Affiliations to develop a training program focused on interprofessional education and training for post-graduate trainees from the different professions including medicine, pharmacy, advanced practice nursing, and mental health. Under the supervision of faculty, CoEPCE trainees work together as an interprofessional team (following a patient-centered medical home model) to co-manage a panel of patients over the year. Medical residents manage 90 patients, and nurse practitioner residents manage 60 patients throughout the year while working collaboratively with other trainees through consults, co-visits, and CoEPCE training activities. This article will describe a training session that was developed to provide education and strategies on the interprofessional management of medication adherence through a pre-session medication simulation activity and debriefing exercise, a lecture, role play with clinical scenarios, and a journal club review. It will also discuss how this activity led to more interprofessional collaboration amongst CoEPCE trainees in regards to medication adherence within the ambulatory care clinic.

Design

CoEPCE trainees engage in weekly interprofessional three-hour training sessions throughout the year. As part of this curriculum, a session was developed with the focus of educating different healthcare professionals

on the importance of medication adherence. Participants in the session included: two nurse practitioner residents, two medical residents, a pharmacy resident, and a clinical psychology fellow. The training session included a lecture led by pharmacy and psychology faculty and trainees, a debrief on a medication simulation activity, role play with clinical scenarios, and a journal club (see Figure 1). The training was evaluated through informal verbal feedback from trainees and a six-question satisfaction survey after the session as a part of quality improvement initiatives for the CoEPCE program.

Figure 1. *Timeline of Training Session*



reviewed in addition to intervention strategies focusing on techniques outlined in the acronym “SIMPLE.” Trainees learned techniques such as encouraging use of adherence aids, reinforcing discussions, providing rewards for adherence, providing emotional support, and acknowledging biases in medical decision making. Other topics included the five steps recommended by Joint Commission in completing a medication reconciliation, where trainees were instructed on the importance of developing a list of current medications and list of medications to be prescribed, reconciling the two lists to make clinical decisions, and ways to communicate changes to patients and caregivers. These skills were evaluated during the clinical scenarios through feedback amongst all trainees. Available online sources, such as Script Your Future, were also reviewed as useful tools to facilitate this process. At the end of the presentation, a group discussion amongst medicine, pharmacy, nursing, and psychology was conducted to discuss the following questions:

- “How would each profession view this topic?”
- “How is the veteran impacted by this topic?”
- “What can the care team learn by working together on this topic?”

Each profession discussed its role and how they could work together across professions as a team to implement these skills with their patients in the ambulatory care clinic.

Lecture

CoEPCE faculty and trainees from pharmacy and psychology worked together to develop and present a 60 minute PowerPoint presentation focused on medication adherence. Common definitions and terminology, such as medication adherence, compliance, and persistence, were reviewed in addition to economic and clinical impact. The five interacting dimensions of nonadherence (therapy-related, patient-related, health-system/team, condition-related, and social/economic factors) were

Medication Simulation Activity and Debriefing

A pre-session assignment was developed for trainees where they were given a simulated diagnosis and received “medication” treatment for one week. Trainees received a handout that outlined the three “medications” that they were expected to take to cure their infection. This included the generic name, color of medication, instructions regarding when to take medications, and counseling points focused on ensuring effectiveness and prevention of adverse reactions and side effects. Different-colored Tic Tacs® were provided and used as the trainees’ “medications”. An example of the medication list is below that shows the instructions and special instructions that were used in this activity (Figure 2).

Trainees were asked to self-document their adherence to the regimen over the one week simulated treatment period. In preparation for the debriefing, trainees were expected to review and answer the following questions during the medication adherence didactic session:

- “How successful were you with following the prescribed regimen above?”
- “What difficulties may have led to you missing doses or not taking the medication as prescribed?”
- “What strategies did you use to remember to take your medications every day?”
- “How do you feel your experience can help you when discussing medication adherence with patients?”

Figure 2. Medication instruction list provided to trainees for simulation activity

Medication	Instructions	Counseling Points
Booriptan 20 mg (white)	Take 1 tablet at bedtime	Take with food. Avoid grape juice and alcohol while taking this medication. Please let your doctor/ pharmacist know if you experience any muscle pain.
Ghoulfloxacin 250 mg (green)	Take 2 tablets twice a day	Separate calcium, zinc, antacids, and magnesium from this medication by 4 hours as taking it together may cause the medication not to work. This medication may be taken with food.
Primikin 100 mg (orange)	Take 1 tablet three times a day	This medication must be taken with food as it can cause upset stomach/nausea. Taking it with food also improves absorption.

Clinical Case Scenario Role Plays

After the medication simulation activity and debriefing, two clinical scenarios were reviewed and discussed. The cases were developed by pharmacy faculty. One clinical scenario presented a patient for the first time to clinic, and a medication reconciliation was required for completion. The other case scenario included a new consult to endocrinology clinic for management of type 2 diabetes. A medication reconciliation and clinical treatment recommendations were required. Trainees worked in pairs to review the case together and then role-played how they would manage the clinical scenario with one assuming the role as the health-care provider and the other assuming the role of the patient. During the scenarios, the remaining trainees observed how each profession performed a medication reconciliation and asked questions concerning medication adherence. At the end of each scenario, feedback was obtained from the observing trainees regarding what was performed well and areas for improvement. Trainees from the same profession were paired together so feedback from an alternative professional perspective could be obtained. The case examples are available in Appendix A.

Medication Adherence Journal Club

A research article was selected by the pharmacy resident focusing on the topic of medication adherence titled "Type 2 Diabetes Patients' and Providers' Differing Perspectives on Medication Nonadherence: A Qualitative Meta-Synthesis." The article chosen was interprofessional in scope and included perspectives from patients and providers on medication nonadherence within treatment of type 2 diabetes (Brundisini,

Vanstone, & Hulan, 2015). Main barriers that were addressed included emotions increasing and decreasing adherence, intentional nonadherence, patient-provider relationship and communication, information and knowledge, medication administration, social and cultural health beliefs, and financial issues. The pharmacy resident trainee led the discussion with feedback from the other professional trainees about how this topic impacts their clinical activities and what they could do as a team to improve patient adherence within their ambulatory care clinic.

Evaluation and Assessment

At the end of each activity during the session, informal verbal feedback was obtained from the medicine, advanced practice nursing, pharmacy, and psychology trainees involved in the session. This feedback was recorded by two observers who served as note-takers. From the different activities, trainees reported having a greater appreciation for the difficulties patients may have with medication adherence. They stated that they felt they could better empathize with patients after completing the medication simulation activity, and could better address potential barriers patients may face when starting or discontinuing medication therapy. Trainees also discussed how they could better work together in clinic to address patients' concerns regarding adherence and how each profession could be more involved as part of the team.

Evaluation of Medication Simulation Activity

Trainees proposed multiple strategies that helped them follow their regimen which included: a portable chart that was color-coded to remember when to take their

“medications,” phone reminders, and strategies to coordinate doses with meals if possible. All trainees indicated missing at least one dose of “medication.” Most trainees self-reported that they missed between three to six doses over the week with the bedtime dose being the most difficult to remember. One of the medical residents stated after completion of the activity, “It was more difficult than I anticipated, and I did miss the nightly dose on the first day. Also, I can now empathize better with patients who do not take medications for hypertension and diabetes because they don’t feel sick. Finally, I realized how though it is easy for me to rattle off information about various medications, it is much more difficult to understand and retain this information about medications you are unfamiliar with.” Additional feedback included concern over the taste of “medications” as the clinical psychology fellow explained she could not take one of the “medications” because it left a poor taste in her mouth, and a fellow nurse practitioner resident agreed. These comments facilitated discussion amongst the trainees to operationalize these issues, while treating patients in clinic, into strategies to educate patients and caregivers to improve medication adherence as a team.

Evaluation of Clinical Case Scenario Role Plays

After each clinical scenario, feedback was given from alternative professions, and trainees provided tips or experiences they have had in the past with similar scenarios they have encountered in their clinic or through their education. For example, during one clinical scenario, completed by the medical resident pair, a recommendation was made to initiate insulin for an uncontrolled diabetic patient, but the patient

was concerned about requiring additional injections beyond the one medication (liraglutide) that was already scheduled. The medical trainee discussed the need to start insulin therapy based on having a high A1c. However, during the debriefing, the nurse practitioner resident recommended a strategy that might improve the patient’s willingness to start insulin therapy. The nurse practitioner resident recommended stating to the patient that by starting insulin multiple other oral medications could be removed from her list and the number of medications taken daily could be decreased. The clinical psychology fellow also recommended tips regarding motivational interviewing that could be utilized to improve patient adherence. All professional trainees were also able to observe how different professions asked open-ended questions and gain new ideas to approach the topic of medication adherence with patients and develop strategies for empowering patients.

Evaluation of Full Session

We collected post-session verbal and written data from the trainees to determine reactions for the full training session. When asked about their reactions to the training, trainees verbally re-emphasized their appreciation for being able to hear about issues concerning medication adherence from multiple perspectives (i.e., pharmacy and psychology). In addition, trainees verbally re-affirmed their enjoyment of the medication simulation activity and role plays. Trainees also completed a 6-item, internally-developed session satisfaction scale (see Table 1). This was on a 5-point Likert scale, where 1 = strongly disagree and 5 = strongly agree.

Table 1. *Post-session evaluation satisfaction scores. n = 3*

	Mean Score (maximum of 5)
I have a clear understanding of the skills/information that were taught.	4.67
I am confident I will be able to use the skills I was taught in practice.	4.67
The teaching methods were effective.	4.67
I feel that the material taught was focused on one profession.	1.00
I know more about other professions now than I did prior to this training.	4.67
The skills/information that were taught are relevant to my profession.	4.67

Discussion

The purpose of this educational strategy was to discuss the importance of medication adherence to different professions during a training session in an interprofessional primary care training program. Methods that have previously been used in current literature include participation in an interdisciplinary medication adherence project, medication simulation activities, surveys after experiential experiences, and didactic teaching (Rickles, MacLean, & Hess, 2012). The most common professions involved in the teaching strategies of the aforementioned studies were pharmacy students, medical students, and nursing students. To the authors' knowledge, this is the first formal training session for residents and fellows during their post-graduate training that has been delivered by interprofessional trainers and completed within an interprofessional training environment that included a medication simulation activity and clinical case scenarios. Similar findings from previously reported research were discovered in regards to the benefit of the training session, but during the feedback sessions, there was knowledge sharing that occurred between the professions that benefited the trainees' professional development. Each profession shared how they approach medication adherence, medication reconciliation, and tips and advice they have found to be useful through their training and clinical practice experience.

As this training session was developed and introduced near the beginning of the training year, it facilitated an open dialogue regarding medication adherence amongst all professions involved in the CoEPCE program. After the session, it was observed amongst CoEPCE faculty that trainees communicated more during morning pre-clinic huddles and handoffs to identify patients with medication nonadherence. When patients were identified as having difficulty with adherence, it was discussed how the team could work cooperatively to improve the patient's health outcomes, such as scheduling an appointment with the pharmacy resident to complete a medication reconciliation or having a co-visit with two providers such as a medical resident and psychology fellow for motivational interviewing or identifying beliefs that interfered with medication adherence. Over time, pharmacy became more involved in completing medication reconciliations for patients through telephone and clinic visits to use techniques that were discussed during the training

session and to communicate with the other healthcare trainees of the CoEPCE program.

While this training was implemented in the CoEPCE context, we expect that it would be beneficial in other ambulatory care settings and with other residency and training programs. As shown in our results, the medication adherence topic resonated with trainees of numerous professions (medicine, advanced practice nursing, clinical psychology, and pharmacy), with all trainees appearing to gain new insights and clinical skills. Thus, we expect that learners of various health professions would find this training beneficial. Along these lines, it would be beneficial for future research to evaluate these types of learning activities amongst a larger sample of post-graduate healthcare professional trainees and include other professions that are members of the healthcare team including social work, dietitians, and physician assistants to gain additional perspectives. Also, the development of a more formal evaluation of the benefits of the medication adherence session beyond verbal feedback and six question satisfaction survey after the training session would be beneficial, as self-report training evaluation measures may not necessarily be indicative of the use of trained skills to the job (Hughes et al., 2016). While faculty feedback suggested that the trainees did engage more interprofessionally around medication adherence after the training, a more robust evaluation would provide stronger evidence to support this link further. Other studies have utilized pre- and post-surveys and thematic analysis in addition to an informal verbal debriefing session (Divine & Cain, 2009; Mangan, Powers, & Lengel, 2012; O'Connor, Savageau, & Centerbar, 2009). Future studies evaluating medication adherence educational strategies across professions are also warranted to develop a systematic approach when developing future interprofessional training programs. Overall, trainees agreed that the experience benefited their training and professional career.

Conclusion

Medication adherence continues to impact patient outcomes and is an importance topic to be addressed amongst all healthcare professionals. The implementation of a medication adherence session as a part of an interprofessional post-graduate training program facilitated discussion on the importance of medication adherence amongst professional trainees from

medicine, pharmacy, advanced practice nursing, and psychology. Benefits gained from the experience included greater understanding of patient difficulties with complex medication regimens, more empathy, and receiving advice and recommendations on how to implement various strategies to improve medication adherence. This formal, multimodal training session can be used within other interprofessional programs and schools to educate future healthcare professionals and provide them with an appreciation for different healthcare perspectives and practical tools that can be implemented in practice.

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Corresponding Author

Ashley L. Adams, PharmD, MS
Clinical Pharmacist

Sells Hospital
PO Box 548
Sells, AZ 85634

ashadams33@yahoo.com

Appendix A

Case Scenario #1

You are seeing a new consult in clinic for diabetes who has the following medication list:

Medication	Instructions	Day Supply	Refills
Atorvastatin 40 mg	Take 1 tablet by mouth at bedtime for cholesterol	30	7
Lisinopril 20 mg	Take 2 tablets by mouth daily for blood pressure	60	2
Metformin 1000 mg	Take 1 tablet by mouth twice a day for diabetes	90	1
Glipizide 5 mg	Take 1 tablet by mouth twice a day for diabetes	90	1
Liraglutide 1.2 mg	Inject 1.2 mg as directed daily for diabetes	30	6
Hydrocodone 5 mg/Acetaminophen 325 mg	Take 1 tablet by mouth every 6 hours as needed for moderate pain	28	0
Trazodone 25 mg	Take 1 tablet by mouth at bedtime as needed for sleep	30	1
Aspirin 81 mg	Take 1 tablet by mouth daily	90	1
Calcium 500 mg/Vitamin D 200 mg	Take 2 tablets by mouth daily	30	1

The patient is 60 years old and weighs 300 lbs. He has been unsuccessful with diet and lifestyle changes for his type 2 diabetes and you are planning on initiating insulin detemir based on his last 2 A1Cs being greater than 12%. On his last visit, you discussed the need for insulin, but he was unwilling to start at that time due to fear of injections and already having difficulty taking his current medications as prescribed.

What changes or interventions would you make to this patient's list in regards to medication adherence? How would you counsel or share this information with the patient?

Case Scenario #2

You have a brand new patient who has not been seen at a VA before. He is 60 years old and was recently diagnosed with NSTEMI during an inpatient hospitalization at Methodist Hospital and is scheduled for VA cardiology follow-up in one month. None of his medications are listed in CPRS and he wants to transfer all his prescriptions and care to the VA.

How would you conduct a medication reconciliation for this patient? What questions would you ask?

Medication List from Patient (will be discussed during the medication reconciliation by one participant)

- Aspirin 81 mg daily (buys OTC)
- Metoprolol succinate 50 mg daily (out of medication in one week)
- Lisinopril 10 mg daily
- Atorvastatin 40 mg daily (does not have a pill splitter and never started taking due to that)
- Multivitamin daily
- Glucosamine (buys tablets from the store)
- Tamsulosin 0.4 mg daily (needs more refills – just got last refill)
- Cranberry extract (does not know dose and helps with preventing UTIs from what his wife told him)
- Hydrochlorothiazide 25 mg daily

*Previous pharmacy was a local independent pharmacy.