A Strategy for Teaching Health Literacy to Physician Assistant Students

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ABSTRACT

This brief report presents a model that incorporates an analogous "see-one," "do-one," "teach-one" pedagogical strategy and experiential learning for mastery of health literacy principles by first-year Master of Science in Physician Assistant Studies students. Students completed a series of health literacy activities including classroom-based lecture (see-one), hands-on application of health literacy activities (do-one), and application and peer-instruction of health literacy best practices with other health science students (teach-one) as part of a two-semester hands-on learning experience. A health literacy knowledge examination, qualitative student feedback, and faculty review of content application were used to assess for effectiveness. Students demonstrated a significant and sustained positive change in knowledge examination scores complemented by positive faculty poster review. Physician Assistant student health literacy knowledge is increased and sustained after application of see-one, do-one, teach-one strategy with students demonstrating health literacy considerations in real-client application during experiential learning. Education programs seeking to meet the call for health professionals prepared to address gaps in health literacy should consider a see-one, do-one, teach-one and experiential learning approach over multiple semesters. **[*HLRP: Health Literacy Research and Practice*. 2021;5(1):e70-e77.]**

The 2010 Health and Human Services National Action Plan for Health Literacy calls for cross-disciplinary action to address current gaps that prevent health services from being delivered in a way that is understandable and beneficial to the health, longevity, and quality of life for all (U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion, 2010). To meet this call, The Joint Commission, which evaluates and accredits health care organizations with a focus on continuous improvement in health care for the public, has embedded health literacy concepts into accreditation standards (Cordero, 2018). Individual health profession's education program-accrediting bodies have also begun incorporating concepts of health literacy, including clear communication skills, to meet this call (Accreditation Review Commission on Education for the Physician Assistant, Inc., 2019). This requirement to incorporate health literacy in health professional education has further heightened the need for a health literacy training model to prepare trainees from a variety of disciplines to address health literacy.

The limited amount of research on health literacy training for health sciences students is focused primarily on pharmacology students (39% of published training research) and medical students (36% of published training research) (Saunders et al., 2019). One study implemented a required lecture for medical students, which showed significant increases in participating student knowledge and self-perceptions between pre- and post-lecture assessments (Coleman et al., 2016). These increases were not sustained on student assessment 1 year later; however, scores again significantly increased after additional health literacy article review. First-year pharmacy students' perceptions of health literacy confidence and knowledge also significantly increased from pre- to post-intervention

after a classroom-based lecture and workshop activities (Mnatzaganian et al., 2017). Experiential learning has also been used to address health literacy education, specifically with health care management undergraduate students, with qualitative success in improving student understanding and attitudes toward health literacy (Riley et al., 2008).

Beginning in 2016, building upon the physician assistant (PA) program's focus on health disparities and cultural competency education and supported by a Health Resources and Services Administration (HRSA) grant (number: T0BHP29989), faculty at a suburban liberal arts university in southeast Wisconsin developed a health literacy curriculum that combines health literacy training and experiential learning. In the absence of an established model for teaching health literacy skills, a curriculum was developed using an analogy of the "see-one, do-one, teach-one" process of teaching medicine (Kotsis & Chung, 2013) to train PA students to serve as health literacy trainers. Although the see-one, do-one, teach-one model has been primarily used in the development of specific skills or competencies (Kotsis & Chung, 2013), and has historically been used for physician education of surgical concepts, it has also been applied for the improvement of health communication in pharmacy students (McDonough & Bennett, 2006). It is at its core a teaching process that allows the learner to be actively involved in the development of a new skill or achievement of a new competency.

The teach-one phase of this analogous see-one, do-one, teach-one pedagogy is further supported by the "train-the-trainer" model, which has been shown to be effective for preparing trainers to deliver cultural competency (Assemi et al., 2007) and health literacy training (Evans et al., 2014). To facilitate active involvement in the understanding of a person's health literacy, an experiential learning component allowing students to engage with real clients was also incorporated. This brief descriptive report presents a see-one, do-one, teach-one type pedagogical strategy with experiential learning and initial data for mastery of health literacy principles by PA students.

METHODS

Using selected health literacy educational competencies for health professionals (Coleman et al., 2013), listed in **Table 1**, the health literacy curriculum was implemented with all 20 first-year Master of Science PA students over the course of four semesters. The health literacy competencies share similar themes to the agreed upon health literacy educational objectives from Coleman, Hudson, and Pederson (2017) and were identified and prioritized by faculty based on the pedagogy's complement: a client-centered case-based interprofessional practice (IPP) student experience, which was granted a B1 "standard educational practice" exemption by Western Institutional Review Board. The experience was part of an academic-community partnership between the university and an urban community center serving the

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TABLE 1

Health Literacy Knowledge Assessment

Health Literacy Education Competency[a]	Paired Health Literacy Assessment Question	Paired See-One, Do-One, Teach-One Component
1. Knows one or more definitions of health literacy	1. Health literacy is defined as (McCleary-Jones, 2012): A) The ability to read and write, identify, understand, interpret, create, communicate, compute, and use printed and written materials associated with varying contexts **B) An individual's capacity to obtain, process, and understand basic information and services needed to make appropriate decisions regarding their health** C) The ability to identify what information is needed, understand how the information is organized, identify the best sources of information for a given need, locate those sources, evaluate the sources critically, and share that information D) The knowledge and ability to use computers and related technology efficiently, with a range of skills covering levels from elementary use to programming and advanced problem solving	See-One: Lecture Do-One: Short Assessment of Health Literacy Teach-One: PA education to teams and client
2. Knows that cultural and linguistic differences between patients and health care professionals can magnify health literacy issues	2. The best way to ensure that a breast cancer prevention brochure is culturally appropriate is to (Cormier & Kotrlik, 2009): A) Review research on the community's culture B) Obtain input from nurses who have worked in the community C) Explore the types of materials currently available **D) Include community members in the design of the brochure**	See-One: Lecture Teach-One: PA education to teams and client
3. Knows that "you can't tell who has low health literacy by looking"	3. Low health literacy levels are most prevalent among which of the following age groups? (Cormier & Kotrlik, 2009): A) 16 to 24 years of age B) 25 to 34 years of age C) 35 to 44 years of age D) 45 to 54 years of age **E) 65 years of age or older** 4. Low health literacy levels are common among (Cormier & Kotrlik, 2009): A) African Americans B) Hispanic Americans C) White Americans **D) All ethnic groups** 5. The research on health literacy indicates that (Cormier & Kotrlik, 2009): A) The last grade completed is an accurate reflection of an individual's reading ability **B) Most individuals read three to five grades lower than the last year of school completed** C) If an individual has completed high school they will be functionally literate D) If an individual has completed grammar school they will be functionally literate	See-One: Lecture Do-One: Short Assessment of Health Literacy Teach-One: PA education to teams

TABLE 1 *(continued)*

Health Literacy Knowledge Assessment

Health Literacy Education Competency[a]	Paired Health Literacy Assessment Question	Paired See-One, Do-One, Teach-One Component
4. Knows that tools are available for estimating individuals' health literacy skills, but that routine screening for low health literacy has not been proven safe or acceptable	6. Which tool is commonly used to assess health literacy? (McCleary-Jones, 2012)?[b] A) Buschke Cued Recall Test B) Denver Developmental Screening C) Mini-Mental State Examination **D) Short Assessment of Health Literacy** 7. Routine screenings for low health literacy have been proven safe and acceptable.[c] A) True **B) False**	See-One: Lecture Do-One: Short Assessment of Health Literacy Teach-One: PA education to teams Teach-One: PA student assessment of client health literacy
5. Knows that everyone, regardless of literacy level, benefits from and prefers clear plain language communication	8. It is good health literacy practice to assume that each patient you communicate with has limited health literacy? (Agency for Healthcare Research and Quality, 2015): **A) True** B) False	See-One: Lecture Do-One: Origami Do-One: Taboo Game Teach-One: PA education to teams
6. Knows that transition points, or "hand-offs" in health care, are especially vulnerable to patient communication errors	9. Transition points, or "hand-offs" in health care, are especially vulnerable to patient communication errors:[c] **A) True** B) False	See-One: Lecture Teach-One: PA education to teams
7. Knows best practice principles of plain language and clear health communication for oral and written communication	10. Which strategies are effective for teaching patients with low health literacy? Select all that apply (McCleary-Jones, 2012): **A) Use simple wording, short sentences (4th-6th grade level)** B) Avoid use of pictures **C) Focus only on key points** **D) Emphasize patient concerns (what the patient may experience, what the patient should do)** E) Include information about disease statistics, anatomy, and physiology **F) Be sensitive to cultural preferences** 11. To use good health literacy practices, staff and clinicians should use which of the following words/phrases when talking to or writing instructions for a patient or family member? (Agency for Healthcare Research and Quality, 2015): A) **Bad** or adverse B) Hypertension or **high blood pressure** C) Blood glucose or **blood sugar** D) **You have the flu** or Your flu test was positive E) The cardiologist is Dr. Brown or **The heart doctor is Dr. Brown** F) Your appointment is at 11:00 AM. Check in 20 minutes early or arrive at 10:40 AM to check in	See-One: Lecture Do-One: Chunk & Check Do-One: Medical procedure instruction Teach-One: PA education to teams and client

TABLE 1 *(continued)*

Health Literacy Knowledge Assessment

Health Literacy Education Competency[a]	Paired Health Literacy Assessment Question	Paired See-One, Do-One, Teach-One Component
	12. Which of the following instructions on the management of diabetes would be least understood by an individual with low health literacy skills? (Cormier & Kotrlik, 2009) A) Check your blood sugar every morning B) Insulin should be taken as directed by your physician C) Diabetes is a disease of energy metabolism **D) Complications associated with insulin include hypoglycemic reactions**	
8. Knows that patients learn best when a limited number of new concepts are presented at any given time	13. When listing side effects for a handout on chemotherapy the health care professional should limit the list to? **A) 2-3 items** B) 5-6 items C) 10-12 items D) 15-20 items 14. Written health care information provided to a patient related to a specific disease should include? (Cormier & Kotrlik, 2009)[b] **A) Only two or three main ideas about the disease** B) All treatment options available to manage the disease C) A detailed explanation of the pathophysiology of the disease D) Statistics on the incidence of the disease	See-One: Lecture Do-One: Chunk & Check Teach-One: PA education to teams and client
9. Knows the rationale for and mechanics of using a Teach Back or "show me" technique to assess patient understanding	15. The most effective way for a health care professional to determine how well a patient with low health literacy understands health care information is to (Cormier & Kotrlik, 2009):[b] A) Utilize a pre-test before instruction and a post-test following instruction B) Ask the question "Do you understand the information I just gave you?" **C) Have the patient teach back the information to the health care professional** D) Verbally ask the patient a series of questions following instructions	See-One: Lecture Do-One: Medical procedure instruction Teach-One: PA education to teams and client

Note. Bold text indicates correct answer to the question. PA = physician assistant.
[a]Adapted from Coleman, Hudson, and Maine (2013). [b]Question has been modified with permission. [c]Question is an original question written by the faculty team.

Hispanic population. The goal of the IPP experience was to improve the health of community-dwelling Hispanic older adults using the social determinants of health. Below is a description of activities aligned with see-one, do-one, teach-one process.

See-One

In the first semester, PA students received a 1-hour didactic lecture on introductory health literacy principles. The lecture, "Improving Health Literacy with Clear Communication," was designed around the identified health literacy educational competencies focused on definitions of health literacy, how it affects patient health, and how to communicate health information clearly. During the second semester, PA students participated in the first phase of the client-centered case-based IPP experience with physical therapy and occupational therapy students in a Hispanic community that is medically underserved. University students in the Spanish program interpreted. In partnership with their clients, student teams were tasked with developing an integrative health case study about their client and identifying opportunities to enhance client well-being founded in the social determinants of health. Through the process of collecting client information, which included a health history, PA students were able

to observe their client's health literacy related to their personal health (see health literacy education competencies 1-3 in **Table 1**).

Do-One

During the third semester, PA students participated in a 3-hour health literacy seminar that focused on tools for assessing health literacy and strategies for improving health communication (see health literacy education competency 4 in **Table 1**). In pairs, students participated in five different active learning exercises (**Table 2**) that aligned with identified health literacy education competencies and focused on clear communication, plain language strategy, "chunk-and-check" technique, and Teach-Back (see health literacy education competencies 5-9 in **Table 1**). Activities were designed to allow for replication of a real-life clinician/patient role-play. After the seminar, students were tasked with creating a patient education brochure using recommended health literacy strategies for effective communication.

Teach-One

In the fourth semester, PA students served as health literacy experts for their IPP team during implementation of the client's chosen well-being activity in the second phase of the client-centered case-based IPP experience. The PA students gave a 15-minute lecture on the basics of health literacy to their IPP teammates, assessed their client's health literacy, and made recommendations for clear communication strategies to be used during the client's well-being activities throughout the semester (see health literacy education competencies 1, 3-5 in **Table 1**). Presentation topics were chosen at the discretion of the PA students based upon their previous health literacy learning and activities, their observations of their client's health literacy, and the specific well-being activity being implemented with their client. At the culmination of activities, the IPP teams presented a professional poster outlining their case-based IPP experience and reporting on the incorporation of health literacy best practices in their client's wellness intervention.

DATA COLLECTION AND ANALYSIS

An assessment of health literacy knowledge was developed using a combination of questions from existing health literacy assessments (Agency for Healthcare Research and Quality, 2015; Cormier & Kotrlik, 2009; McCleary-Jones, 2012) and original questions to address the health literacy educational competencies selected from Coleman, Hudson, and Maine (2013) (**Table 1**). The assessment was administered between the "see" and "do" stages, between the "do" and "teach" stages, and after the "teach" stage. Quantitative data analysis was performed using the program R (R Foundation for Statistical Computing, 2017). Comparison of pre-intervention and post-intervention data was assessed via linear mixed models via R using Satterthwaite approximation for p values and bootstrap confidence intervals (R Foundation for Statistical Computing, 2017).

Qualitative feedback on perceived health literacy skills and knowledge was collected from PA students at the end of activities. Additionally, the IPP team professional posters were reviewed for incorporation and demonstration of health literacy best practices. IPP team posters were evaluated using a standardized rubric by interprofessional teams of faculty who had been identified and selected based on their interprofessional and/or health literacy backgrounds. Two of the eight rubric domains were developed to assess for health literacy and communication with Likert scale responses (scale of 1-4, where 1 = *not met* and 4 = *excellent*). The IPP team demonstrates ability to evaluate and incorporate health literacy concepts and also demonstrates the use of data to drive the structure of wellness care and health literacy education programming.

RESULTS

The 20 PA students ranged in age from 21 to 41 years (average: 25.5 years), 17 (85%) identified as women, 19 (95%) identified as White/non-Hispanic, and 1 (5%) student identified as Asian.

Health Literacy Knowledge Assessment

The PA students scored an average of 82.1% (±4.5%, 12.3/15) on the developed health literacy knowledge assessment administered prior to the start of do-one activities. After do-one activities, students scored an average of 88.7% (±4.3%, 13.3/15). After the teach-one activities, students scored a final post-intervention average of 89.3% (±2.7%, 13.4/15). Using a linear mixed model, final post-intervention scores increased by a statistically significant average of 0.072 (beta = 0.072 ± 2.31%, $p < .002$, 95% confidence interval [0.03, 0.12]) compared to pre-intervention findings.

Qualitative Feedback of Health Literacy Knowledge and Skills

Qualitative student feedback related to knowledge learned from health literacy training included importance of and how to use active listening (10.5% of students), diverse teaching methods based on visual, auditory, or hands-on learning preferences (22.8% of students), and how to communicate without medical jargon at a fourth-grade level (25.7% of students). Feedback on a skill that was learned

TABLE 2

Clear Communication Active Learning Exercises

Station	Station Description	Goal
Chunk & Check	Two students take turns role playing as clinicians and patient. The clinician identifies the three most important pieces of a written patient handout and explains it to the patient	Learn how to communicate: What does the patient need to know? What does the patient need to do? Why is it important for the patient?
Origami	Paired students sit facing away from each other (they cannot see what the other is doing). Student 1 will be the reader and will read the origami instructions step-by-step with their back turned to Student 2. Student 2 will attempt to make the origami and can only ask Student 1 to repeat the instructions, but no other questions can be asked.	Build empathy for the listener. Understand the challenge of clear communication and its vital role in patient mastery of their health condition.
Health literacy assessment tool: Short Assessment of Health Literacy	Students take the health literacy assessment that they will later administer to their community client	Build empathy, understanding of health literacy skills
Medical procedure instruction	Students role play as a clinician explaining to a parent how to use a nebulizer	Practice Teach-Back
Taboo game	Student 1 tries to explain a medical term listed on the card without using forbidden jargon words. Student 2 tries to guess the word. Roles are switched with next card in deck.	Practice "living room" language

Note. Activities inspired by the workshop "Doctors are from Mars, Patients are from Venus: Teaching Health Literacy Strategies Across the Medical Education Continuum to Close the Communication Gap and Keep Patients Safe and Well," a workshop presented by B. W. Bayldon, R. A. Connelly, B. P. Dreyer, A. K. Morrison, S. Forbis, S. Yin,. . . . T. L. Turner. Presented at the Pediatric Academic Societies Annual Meeting; April 27, 2015; San Diego, CA.

from their health literacy training included communicating clearly using friendly, culturally sensitive language (42.7% of students) and use of Teach-Back and diverse teaching (24.3% of students).

Health Literacy Content on IPP Team Posters

Review of the final IPP team posters found that all teams made health literacy considerations during their client's wellness intervention. IPP teams identified their PA team members as the expert in health literacy and that the PA student client assessment findings on health literacy were useful for determining which teaching methods would be appropriate for their specific client's wellness intervention. Examples of health literacy considerations included generation of bilingual client education handouts with pictures and step-by-step instructions, research on and acquisition of Spanish language materials in appropriate dialects and reading levels, and intentional design of activity demonstration with Teach-Back.

Interprofessional faculty review of the IPP team posters revealed that team ability to evaluate and incorporate health literacy concepts and use data to drive the structure of health literacy education programming was considered to be between good and excellent (3.53 ± 0.52 and 3.40 ± 0.63, respectively). Comments from faculty reviewers included that teams understood their clients' backgrounds and that teams were aware of and used their clients' health literacy data to make decisions about programming.

DISCUSSION

This study outlines a health literacy pedagogy that was effective in increasing PA student knowledge of health literacy principles through the use of an objective measure of knowledge, and it also suggests an increased ability to apply these principles. As has been reported in pharmacology students (Mnatzaganian et al., 2017), PA student health literacy knowledge increased after a combination of classroom-based and workshop activities. This study, which also implemented a longitudinal approach to and assessment of health literacy training, demonstrated that the see-one, do-one, teach-one model of student health literacy training retained improved assessment scores over the course of a didactic year, pre-

venting the drop after initial training seen in previous study (Coleman, Peterson-Perry, et al., 2017). Given the lack of a validated health literacy knowledge assessment tool and to support the content validity of these results, this study employed faculty content experts to evaluate content application on the final posters and saw a positive relationship between both assessments (Grant & Davis, 1997).

Future study is recommended to distinguish longitudinal results over the full period of study with assessment before and after each curriculum component. Assessment and reflection prior to and after the PA student clinical rotations is also recommended. This study did not quantify changes in skills and behaviors, which is recommended in the future. An additional study would be development of an established and validated health literacy assessment tool for health professionals. Due to vulnerability to response shift bias due to repeated exposure of test questions, future studies might also consider changing assessment questions between exposures. Given the current lack of a best practice model for education of health professional students to address health literacy, this study offers a unique and successful pedagogy.

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