Using Standardized Patient Assessments to Evaluate a Health Literacy Curriculum

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BACKGROUND AND OBJECTIVES: Patients' health literacy is a growing concern as patients are expected to perform more self-care. While many US schools implement health literacy in their curricula, time spent on the topic ranges from 0 to 8 hours and is largely didactic. Evaluation of health literacy skills is not well defined. The effectiveness of a health literacy curriculum for third-year medical students was evaluated by two standardized patients assessments (SPAs).

METHODS: All third-year medical students complete a required 4-week clerkship in family medicine. After participating in seminars on patient-centered communication, health literacy, mindfulness, implicit bias, and chronic disease management, students complete SPA-1. Students also work in two team-based teaching clinics with chronic disease patients with limited health literacy and receive faculty feedback. At week 4, students complete SPA-2. Six raters evaluated all video-recorded SPA performances using the Common Ground validated instrument and a tailored health literacy skills checklist.

RESULTS: Using SPAs and reliably-trained nonclinical raters is an effective method for training and evaluating students about health literacy. Two classes (2013 and 2015) had significant improvement in Common Ground core skills from SPA-1 to SPA-2. For all classes, a small but significant increase in student use of health literacy checklist was seen from SPA-1 to SPA-2.

CONCLUSIONS: Didactic sessions prepare students to demonstrate competence on Common Ground and health literacy skills. Improvements in students' health literacy and communication skills are feasible in a 4-week clerkship utilizing the curriculum and evaluation process described.

Increasingly complex health systems necessitate patients learn and routinely perform self-care skills. Recognizing and improving patients' health literacy has emerged as a central health concern. The Institute of Medicine defines health literacy as "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions."[1] Ninety million adults have limited health literacy and 75% do not disclose this to providers.[2] These patients are likely to face worse outcomes, use services less effectively, and among elderly persons and those in rural areas, experience poorer health and higher mortality.[3,4]

Standardized patient assessments (SPAs) provide for direct observation, training, and evaluation of student-patient interactions during histories, physical examinations, and wrap-up. SPAs offer objective data on learner performance.[5,6] The SPA performance evaluation is enhanced when paired with evaluations by trained raters.[7] Student performance in a 32-hour health literacy curriculum using interactive seminars, patient-centered communication, and health literacy skills was assessed with SPAs.

Methods

Participants included 435 third-year medical students completing a required 4-week clerkship in family medicine at the Wake Forest School of Medicine (WFSM) for the graduating classes of 2013 to 2016. Participants signed informed consents approved by the WFSM Institutional Review Board. In week 1, students attend five case-based seminars focused on recognizing problems and solutions associated with low health literacy (Table 1).[8-23] The curriculum includes two team-based teaching clinics (TBTCs). Paired students participate in the care of faculty members' continuity patients with

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Table 1: Components of Health Literacy Curriculum

Week 1: Five Interactive Case-Based Seminars Focused on Recognizing Problems and Solutions Associated With Low Health Literacy		
Seminar	**Instruments or Resources Used**	**Brief Description**
Common Ground Seminar	**Common Ground Communication Model**,[8] 6 core skills: (1) Rapport Building; (2) Agenda Setting; (3) Information Management; (4) Active Listening; (5) Addressing Feelings; (6) Reaching Common Ground (wrap-up). Skill scores range from 1 (ineffective) to 5 (highly effective) http://www.stfm.org/fmhub/fm2004/March/Forrest189.pdf	- Evaluation of a standardized video of a physician and a low health literacy patient with diabetes using the Common Ground instrument - Learners self and peer assess and evaluators give feedback[9]
Health Literacy Seminar	**Agency for Healthcare Research Quality (AHRQ) Health Literacy Universal Precautions Toolkit.**[10] - 21 tools addressing communication, self-management, empowerment and support systems - Appendices of >25 resources https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/literacy-toolkit/healthlittoolkit2.html **Newest Vital Sign Instrument**,[11,12] 6-item validated instrument for patients, related to understanding of information on a food label https://www.pfizer.com/files/health/nvs_flipbook_english_final.pdf	- Students review toolkit prior to the session - Highlights problems and solutions to effective patient care and assessing health literacy in the clinic - Students present two stories describing effective and ineffective health literacy experiences with a provider and patient from their first years of medical school.[13] - They discuss patient outcomes and missed opportunities for effective communication
Implicit Bias Seminar	**Implicit Association Test (IAT)**,[14] validated instrument measuring response times to determine unconscious biases. If an individual associates a group with negative attributes, they will be slower to pair that group with positive words[15,16] https://faculty.washington.edu/agg/pdf/Gwald_McGh_Schw_JPSP_1998.OCR.pdf	- Students view images of "young" or "old" people (one IAT example) and pair them with negative or positive words - They debrief results - They watch two videos depicting implicit bias with a patient
Mindfulness Training	3-hour sessions to increase real-time empathy, self-awareness, self-reflection, and field awareness in the clinical encounter Voice-over video PowerPoints	- Provides users with knowledge, skill review, and opportunities for reflection. Fosters learning about complex communication and relationship challenges[17]
Diabetes Care	American Association Standard of Care Guidelines[18-22]	- Students identify patient barriers and how providers detail alternatives and solutions - Discussion of diabetes outcomes aimed at a low health literacy patient with type 2 diabetes and depression
Week 2 (Interpreter Training, SPA 1)		
Interpreter Training	12-item checklist of skills rated on a scale of 0 to 2 (0=not performed, 1=partially performed, 2=performed): (1) Gave instructions and expectations to the interpreter at beginning of visit; (2) Did not allow side conversation; (3) Did not talk in ling units of speech; (4) Did not allow the interpreter to sit in the way of the patient and doctor; (5) Did not allow the interpreter to paraphrase or omit information; (6) Did not allow the interpreter to use his/her own ideas; (7) Checked for patient's understanding by asking patient to repeat instructions; (8) Spoke directly to the patient, not the interpreter; (9) Listened to the patient and interpreter and observed their verbal and non-verbal communication; (10) Did not allow the interpreter to take control of the visit; (11) The health care provider did not become impatient because the interview took longer/was more difficult; (12) Thanked the interpreter for their services.	- 90-minute interview with a Spanish-language Standardized Patient (SP) and certified interpreters, who provide feedback to students using a 12-item checklist.[23]

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Table 1 (continued)

Week 2 (Interpreter Training, SPA 1)		
Seminar	**Instruments or Resources Used**	**Brief Description**
SPA 1	Simulated patient (SP) chart Student-created SOAP note on patient Rater-evaluation of SPA video Trained provider feedback to student on SPA encounter – Students expected to address diabetes diagnosis by "breaking the news" to SP, addressing feelings and expectations, and developing a management plan together with SP.	SP with symptoms of diabetes and not aware of condition (consumes soda, fast food and does not exercise).
Week 2-4 (Team-Based Teaching Clinic–2 Sessions)		
Team-Based Teaching Clinics (TBTC)	Common Ground Instrument (faculty facilitators were trained in using the Common Ground and health literacy skills) Students reviewed patient's chart, performed a focused history, physical and patient wrap-up in real time with faculty. Students completed a written plan using concise, bulleted phrases to share with patient during the wrap-up to facilitate and assess patient understanding.	Students practiced seminar components in faculty members' continuity patients with chronic disease. Students, supervised by faculty, cared for patients in 4-hour clinical session, with immediate feedback. Patient wrap-up included explaining impressions using plain talk, and checking for agreement, feasibility and understanding using teach-back method.
Week 4 (SPA 2)		
SPA 2	Simulated patient (SP) chart Student-created SOAP note on patient Rater-evaluation of SPA video Trained provider feedback to student on SPA encounter – (Ideally, student identifies supplement as potential cause for increased blood pressure.)	SP with hypertension and hyperlipidemia. At regular check-up, blood pressure is high. SP exercises regularly and consumes healthy diet. SP mentions taking herbal supplement to improve energy.

chronic diseases in 4-hour TBTCs. Students are evaluated during two 20-minute SPAs that include a focused interview, exam, treatment plan, and completing a "subjective, objective, assessment, and plan" (SOAP) note.

Training and Instruments
Eight faculty received training in the Common Ground model and health literacy skills curriculum. The Common Ground instrument addresses six criteria-based, patient-centered skills. Interview skills are measured by a global rating that incorporates comprehensive criteria for SPA (Table 2). In the original validation, the interrater reliability was 0.85 for the global rating and 0.92 for the overall checklist assessment.[8]

To evaluate health literacy competency, we used seven questions from the US Health Resources and Services Administration (HRSA) health literacy website (Table 3).[24] Reliably trained raters scored students' performance for SPA via digital recordings. Three times annually, raters received iterative feedback to assure that scoring was consistent with benchmarking.

Data Collection and Analysis
After video recording, SPA data was deidentified. Reliably trained raters evaluated both performances using the Common Ground instrument[8] and completed the health literacy skills checklist (Table 3). Paired Common Ground scores and health literacy checklists were evaluated for differences between SPA-1 and SPA-2 using SPSS.[25] Repeated measures analyses of variance were performed separately for the Common Ground and health literacy measures. SPA-1 vs SPA-2 was a within-subject variable and student class was a between-subject variable. Pearson's correlation was used to correlate Common Ground global scores and health literacy scores.

Results
Participants were medical students in the classes of 2013 (n= 109), 2014 (n=120), 2015 (n=107), and 2016 (n= 98). Students had an average age of 26.8 years (range 24 to 43), and 54% of students were men. Overall, 72% of students were white, 11% African American, 8% Asian, and 9% other. For the classes of 2013, 2015, and 2016, 314 of 338 (93%) videos had both SPA sessions (data not captured for class of 2014 SPA-2).

A health literacy curriculum with SPAs using trained raters near the beginning and at the end of the clerkship was implemented. After SPA-1, and receiving 8 hours of training with health literacy and communication components, students' global scores were in the low competent range on Common Ground and on the health literacy skills checklist. Common Ground scores analyses revealed a main effect of class, a main effect of first and second SPA sessions, and an interaction between

Table 2: Examples of Common Ground[8] Skills: "Active Listening", "Reaching Common Ground", and "Overall Interview" Criteria[1]

Active Listening	
Score Example	**Criteria**
3	Demonstrates some interest in the patient's perspective on illness (PPI) through occasional exploration of clues (efforts may not be effective). May not pick up on clues but rather asks about the patient's ideas.
4	Demonstrates genuine interest in the PPI by using active listening at least part of the time. Does explore the clues initially, but not always fully. Once identified, PPI will be partially addressed with some elements of acknowledgement, normalization, and building a plan based on the PPI.
Reaching Common Ground	
Score Example	**Criteria**
3	Partial or minimal understanding of patient's knowledge. Provides information with general clarity. May include some jargon. Some effort to determine understanding and/or feasibility (uses close-ended question).
4	Plan begins with some understanding of patient's knowledge and perspective. Explains clearly with only occasional use of jargon. Checks for understanding and feasibility.
Overall Interview	
Score	**Criteria**
1	Inadequate communication skills; likely to create significant clinical problems (patient dissatisfaction or confusion).
2	Uses some communication skills effectively and others ineffectively; certain areas of communication might cause clinical problems (patient dissatisfaction or confusion).
3	Uses most communication skills effectively; some interview behaviors present which, if modified, could lead to an even more effective impact on a real encounter.
4	Uses all communication skills effectively; minor suggestions for change are noted which are unlikely to have measurable importance on encounter.
5	At the level of an experienced clinician who is expert in using all communications skills effectively. Skills demonstrated such that a patient would likely note such skills to friends and family.

[1] For each skill, participants receive a score rated on a scale of 1 to 5. The average scores were between 3 and 4.

Table 3: Health Literacy Skills Checklist: Tool Used by Raters During SPA[1,2]

Identifies "red flags" and risk factors for limited health literacy
Uses newest vital sign scores to tailor dialogue with patients (patient's score is 3. Score of 0-1 suggests high likelihood (50% or more) of limited health literacy, score of 2-3 indicates the possibility of limited health literacy, score of 4-6 almost always indicates adequate health literacy)
Initially tailors information given to the patient to address their health literacy level and cultural background
Presents manageable amounts of information in plain language
Summarizes patient education and follow-up plan based on patient's level of understanding
Utilizes the interactive technique to verify patient understanding of information given them ("Teach-Back method")
Adjusts instructional methods appropriate to the patient's level of understanding based on the teach-back

[1] Tool used by reliably trained raters via the digital recording evaluation of standardized patient assessments (SPA).

[2] Each item was rated on a scale of 0 to 2 (0: Not performed, 1: Partially performs, 2: Performs well) for a total score of 0 to 14.

class and session (Table 4). The classes of 2013 and 2015 showed significant improvements from the first to the second SPA session (Table 4). The class of 2016 improved, but the difference was not significant.

Health literacy scores showed significant main effects of class and SPA-1 versus SPA-2 (Table 5). Post hoc tests showed all classes had improved scores for health literacy skills from SPA-1 to SPA-2, attributed to communication skills. Post hoc examination of the main effect of class (SPA scores averaged across both sessions) revealed that the class of 2013 had higher health literacy scores than the other classes combined across both SPAs. The class of 2015 had higher average scores than the class of 2016. The Common Ground instrument scores were positively correlated with health literacy scores at each SPA session (Pearson correlation .45 SPA-1, .50 SPA-2).

Table 4: Common Ground Measures for SPA

	N	SPA Session 1		SPA Session 2		Total	
		Mean	SD	Mean	SD	Mean	SD
Class of 2013	109	3.27	.61	3.68	.52	3.47	.44
Class of 2014[1]	120	3.32	.53	--	--	--	--
Class of 2015	107	3.13	.61	3.46	.61	3.29	.44
Class of 2016	98	3.35	.55	3.49	.54	3.42	.45
Total (2013, 2015, and 2016)	314[2]	3.25	.60	3.54	.56	3.40	.45

[1] Due to financial constraints and administrative decisions by the clerkship director, the class of 2014 had SPA session 1 only and was not included in the total above or in the analysis.

[2] Out of the total 338 videos for classes 2013, 2015, and 2016, Common Ground measures were not available for 24 due to either no consent, technical difficulties, absences or unmatched pairs.

Repeated measures ANOVA: Main effect of Class (P=.009), Main effect of Time (P=.000), Interaction of Class by Time of Assessment (P=.027)

Post hoc comparisons (Bonferroni):

SPA 1 to SPA 2 class of 2013 P=.000, class of 2015 P=.000, class of 2016 P=.065.

Post hoc comparisons (Bonferroni):

SPA session 1 class of 2016 > class of 2015 (P=.023)

SPA session 2 class of 2013 > class of 2015 (P=.011)

Table 5: Health Literacy Measures for SPAs

	N	SPA Session 1		SPA Session 2		Total	
		Mean	SD	Mean	SD	Mean	SD
Class of 2013	104	7.60	3.48	10.28	3.04	8.94	2.29
Class of 2014[1]	120	7.15	3.49	--	--	--	--
Class of 2015	104	6.98	3.61	8.43	3.52	7.71	2.64
Class of 2016	99	6.06	3.77	7.53	3.24	6.79	2.70
Total (2013, 2015 and 2016)	307[2]	6.89	3.67	8.77	3.46	7.83	2.70

[1] Due to financial constraints and administrative decisions by the clerkship director, the class of 2014 had SPA session 1 only and was not included in the total above or in the analysis.

[2] Out of the total 338 videos for classes 2013, 2015 and 2016, health literacy measures were not available for 31 due to either no consent, technical difficulties, absences or unmatched pairs.

Repeated measures analysis: main effect of class P=.000, main effect of time P=.000.

Post hoc comparisons for class (Bonferroni): class of 2013 > 2015 (P=.002), class of 2013 > 2016 (P=.000), class of 2015 > 2016 (P=.034).

Post hoc comparisons for time SPA 1 to SPA 2 (Bonferroni): class of 2013 P=.000, class of 2015 P=.002, class of 2016 P=.002.

Discussion

Training medical students to assess health literacy is essential for effective patient communication. The curriculum offers a range of activities focused on the attitudes, knowledge, and skills for a learner to effectively create care plans with patients of diverse backgrounds and health literacy levels. The unbiased raters' assessments using a validated scale increases confidence in the results. Our pool of raters remained stable over time, maintained their enthusiasm, and demonstrated sustained ownership regarding the success of this curriculum. Between SPA sessions, students participated in two TBTCs. Thereafter, both communication and health literacy scores increased from SPA-1 to SPA-2 for the classes of 2013, 2015, and 2016.

One limitation of this research is that the clerkship directors preferred an introduction to curriculum before SPA-1 for students to learn health literacy knowledge and skills before being evaluated. Health literacy and communication seminars are provided in the first 2 days of the clerkship. While we do not have a true baseline, scores between the two SPA sessions improved significantly.

This curriculum provided a robust medical student experience designed to improve care for patients with limited health literacy. Rater training provides a structure that other medical schools could adopt to enhance their evaluation of students' skills. Other programs could use the curriculum described with only the cost of training raters and standardized patients. Since patients are expected to perform increasing self-care, learners need to know what patients understand in order to learn how to communicate effectively.

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