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The role of health literacy in simulation education: needs assessment and call to action

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ABSTRACT

Introduction

Understanding health literacy is crucial to improve health and reduce disparities. Simulation is an effective active learning strategy to teach health literacy. Our aim was to perform a needs assessment of health literacy education using simulation, to guide faculty development for simulation educators.

Methods

Utilizing Kern's curricular development process, problem identification, general and targeted needs assessments were performed. PubMed, CINAHL and PsycINFO searches were conducted using terms for health literacy and 'prioritized health literacy competencies' (PHLCs). Abstracts and full texts were screened. Simulation events that could feasibly incorporate health literacy were included. Data were collected regarding learners, type of event and incorporation of PHLCs. A targeted needs assessment used electronic survey to identify knowledge, attitudes and beliefs of local simulation educators regarding health literacy. Health literacy components of local simulation events (2018–2019) were assessed using a tool developed by the investigative team.

Results

Literature search identified 614 published articles, and 67 were included in analysis. 'Avoidance of jargon' (14/67) and 'patient-centred approaches' (11/67) were the most commonly cited PHLCs. No articles mentioned 'delivery of information in 1–3 need-to-know elements'. Of the 57/881 local simulation events that could feasibly incorporate health literacy, 17/57 did so. 'Jargon' and 'patient-centred' care were the PHLCs most often present in learning objectives. Survey response rate was 77%. Only 18% (3/17) of local simulation educators demonstrated 'comprehensive understanding' of health literacy. Educators reported understanding 'using universal precautions in written and oral communication' (mean Likert 3.3) and 'need-to-know/need-to-do concepts' (3.4) least well. The majority felt including health literacy was important in simulation and believed they did this.

Discussion
There is a critical need to formalize and standardize language used when creating and studying simulations involving health literacy. An interprofessional faculty education program may assist faculty understanding of PHLCs when designing focused simulations for future healthcare providers.

What this study adds

- Current literature describing simulation education to teach health literacy competencies is rare
- Most identified simulation education teaches 'avoidance of jargon' and 'patient-centred approaches'
- Local needs assessment revealed simulation educators believe health literacy is important to teach
- The minority of local educators demonstrated 'comprehensive understanding' of health literacy
- Prioritized health literacy competency incorporation in local simulation education can be improved

Introduction

National health objectives cite enhancing health literacy as an overarching goal for improving health and advancing health equity [1]. While there are numerous perceptions of what health literacy entails, the U.S. Department of Health and Human Services (U.S. DHHS) defines personal health literacy as 'the degree to which individuals have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others. Only 12 in 100 U.S. adults demonstrate proficiency in these skills, and disparities are evident among certain racial and ethnic minority groups as well as those with limited education or income [2]. Limited health literacy has been associated with less uptake of preventive measures, unnecessary use of emergency care and higher rates of mortality [2–5]. As value-based reimbursement reform strategies increasingly focus on these and other measures of patient outcomes and costs, healthcare systems and providers must ensure that they are intentional in their efforts to overcome limited health literacy and optimize the likelihood among all patients to understand and act on instructions. The role of healthcare providers in addressing limited health literacy is illuminated in U.S. DHHS' complementary definition for organizational health literacy 'the degree to which organizations equitably enable individuals to find, understand, and use information and services to inform health-related decisions and actions for themselves and others' [1] and by the Joint Commission which positions health literacy as a cornerstone of patient safety efforts [6].

Despite the implications of limited health literacy on patients and the systems which care for them, evidence-based practices to address health literacy in clinical practice are not universally applied. For example, a review of patient survey data from 2011 to 2014 found that 3 in 10 providers did not provide instructions that were easy for patients to understand, less than 3 in 10 used the teach-back method to confirm patient understanding and fewer than 2 in 10 patients were offered help completing forms [7]. A likely contributor to these practice outcomes is the limited and varied nature in which health literacy strategies are integrated into health professional training. Formal inclusion of health literacy and clear communication competencies in curricula varies by university and health discipline [8]. Further, accreditation standards may not discreetly define the knowledge or skills students should gain. In an effort to delineate the specific ways in which healthcare providers can address the known challenge of limited health literacy, Coleman et al. produced a report which outlines specific competencies for these training programs [9]. A subsequent study by that team resulted in a consensus-driven prioritized list of core health literacy competencies (PHLCs) to guide healthcare professionals in creating educational events. These events may be offered through a selection of pedagogical approaches including small-group teaching, problem-based learning, and simulation [8].

Simulation is an active learning strategy that, when coupled with immediate debriefing, translates to effective learning [10,11]. Principles and competencies of health literacy may be incorporated into simulation education through learning objectives and deliberate practice employed by means of role-playing, simulated patients and virtual or telesimulation. This approach allows students to rehearse different strategies with a goal of attaining competencies within health literacy in a manner not afforded by other means (e.g. problem-based learning or small-group learning in which no simulated patient or family caregiver is included). Rehearsal of these skills within a psychologically safe environment in which it is acknowledged acceptable to make mistakes in order to learn is crucial to translation of learning into clinical practice. Despite this, there is little current literature regarding the incorporation of health literacy competencies into simulation events and no current recommendations for best practice in health literacy simulation design, delivery or assessment. Effectively teaching PHLCs through simulation education is important. To achieve this, simulation educators must be well-versed in these principles and

able to identify strategies to address the barriers and challenges to implementation. The aim of this work was to characterize current inclusion of PHLCs in simulation for healthcare professional education through a general needs assessment of the current literature and targeted needs assessment of the local simulation educational efforts and educator perceptions. The aim of this needs assessment was to determine to what extent health literacy competencies were integrated into simulation learning events within the published literature and locally. Results will inform the development of faculty education designed to more comprehensively integrate PHLCs into future simulation learning.

Methods

To create curricula for simulation educators, following Kern's six steps is a well-accepted approach with demonstrated effectiveness. Kern describes step 1 as problem identification and general needs assessment and step 2 as targeted needs assessment, citing both as essential to adequately meet learners' needs [12]. In the current work, general needs assessment was performed in collaboration with a medical librarian through a scoping literature review of simulation and health literacy. Targeted needs assessment was performed to identify the knowledge, attitudes and beliefs of local simulation educators with regard to teaching and demonstrating the core principles of health literacy in simulation education. In addition, the targeted needs assessment examined the current quality of health literacy components in local simulation events.

General needs assessment: literature review

The aim of the scoping review was to assess current status of simulation education utilized to teach health literacy concepts. The goal was to assess assimilation of 'prioritized health literacy competencies' (PHLCs) as described by Coleman [8,9], into simulation education learning objectives, educational strategies and learner assessment. Ultimately, the aim is to use these findings to direct faculty development and inform simulation education efforts targeted at areas of educational deficiency identified within the literature.

In association with a medical librarian, searches of PubMed, CINAHL and PsycINFO were performed to include all articles published in the last 10 years. Controlled vocabulary Medical Subject Headings (MeSH) describing simulation and health literacy were tested for relevancy and utilized to retrieve articles. Consultation with content experts and harvesting language from core articles enabled use of natural language (title, abstract and other terms) to retrieve articles (for Search Strategies, see Appendix 1). The search terms included those pertaining to health literacy explicitly, and to terms within the 'prioritized health literacy competencies' (PHLCs) as described by Coleman [8,9]. Two experienced trained reviewers performed deduplication of the abstract list and then evaluated abstracts for inclusion (AC, KJD). Abstracts were excluded if health literacy or a PHLC could not feasibly be incorporated within the goals and learning objectives of the simulation learning event. Those articles describing simulation education that focused more generally on communication or patient education, but without specific mention of health literacy or the prioritized competencies, were excluded. Full-text articles were screened for inclusion and included if the work described a simulation educational event in which health literacy could feasibly be incorporated into learning objectives, case materials including SP materials, learner assessment or event evaluation. Subsequently, data were extracted from included full-text articles by two trained reviewers (AC, KJD). Extracted data included details of the learners, the type of simulation event and how PHLCs were incorporated into any or all of the following components of the event: learning objectives, case materials or SP materials, learner assessment and event evaluation. During data extraction, if previously published tools or assessment criteria were referred to in the manuscript as integral to the simulation, the reviewers also accessed portable document formats (PDFs) of referenced material, where available, to assess these tools for PHLCs.

Targeted needs assessment: assessment of the quality of health literacy components of simulation events

All simulation education events conducted at a simulation centre in an academic health sciences institution were identified for the 2018–2019 academic year. This year was selected as it was the last complete academic year unaffected by the restrictions of the COVID-19 pandemic. The simulation centre educates a diverse range of both undergraduate and postgraduate learners from the Colleges of Nursing, Medicine, Health Professions, Public Health, and Pharmacy and benefits from collaboration with the Office of Interprofessional Education. Since the simulation centre opened in 2011, 86,356 learners have participated in 2890 simulation educational activities. Simulation educational offerings are diverse and include technical skills training, interprofessional teamwork, communication, life support and crisis resource management. Simulation education includes simulations with task trainers, robotic simulators, manikins, simulated participants and simulated patients.

Documentation associated with all events was reviewed by two investigators, (KJD, SJ) to identify those in which it was appropriate to assess the health literacy component(s) of the simulation event. Events were excluded from analysis if they could not feasibly include a health literacy component (i.e. procedural skills sessions, code simulations). Through consensus discussion, the investigative team developed an assessment tool to gather information regarding inclusion of PHLCs in each simulation event. The Assessment Tool for Health Literacy Competencies within Simulation Events was completed for each of the following document for the simulation educational event: learning objectives, case materials/ SP education, learner assessment and course evaluation tools. The tool captured whether 'health literacy' was specifically mentioned in the work and then captured data regarding which of Group 1 Health Literacy Practices [8] were included in the learning objectives, case materials/SP education, learner assessment and course evaluation tools, whether

quoting practices verbatim or using equivalent language. To control for inter-rater variability, a random selection of nine simulation events was independently assessed by each member of the team. During a subsequent group discussion, investigators identified issues with data collection and resolved disagreements regarding components of each event until consensus was achieved. Remaining simulation events were then assessed by two investigators (KJD, SJ). Written materials gathered and assessed for the learning events included learning objectives, standardized patient materials and education, student assessments and course evaluation tools.

Targeted needs assessment: identification of knowledge, attitudes and beliefs of stakeholders

To complete the targeted needs assessment, an electronic survey was created with the objective to assess knowledge, attitudes and beliefs pertaining to incorporation of health literacy into simulation education. The target population was the simulation educators responsible for the creation of the local simulation events included in preceding assessment. The goal was to use the results to structure local faculty development and improve education on health literacy for healthcare professionals. This work was reviewed by the local Institutional Review Board and deemed not human research due to the quality improvement focus.

An iterative process was used to create and pilot the survey. The investigative team met with faculty simulation educators to identify key issues regarding health literacy education through simulation, and these findings were translated into question-and-answer categories. The survey was tested on educators at the local institution who were not part of the investigative team and feedback was incorporated in terms of content, ease of understanding of concepts, time taken to complete and general usability. The final survey questions pertaining to (i) current understanding of health literacy, including the PHLCs, (ii) education received in health literacy during their training and career, (iii) perception of the value of health literacy in simulation education, (iv) current behaviours regarding incorporation of health literacy in simulation events and (v) respondent demographics (Table 1). The respondents' understanding of health literacy as a concept was assessed based on their response to an open-ended question using a rating scale developed by the investigative team led by the health literacy subject matter expert. Authors developed the rating scale using the current US DHHS definitions of personal and organizational health literacy [1]. Key concepts within the descriptions provided by respondents were identified and included: detailing both personal and organizational (or provider) attributes; describing that health literacy is comprised of multiple skills (not merely knowledge); and acknowledging focus on patient *use* of information (in decision-making and other health-related action). 'Comprehensive understanding' was defined as description of all three concepts, 'moderate understanding' as description of two key concepts, and 'limited understanding' of 0–1 key concepts.

The survey was delivered to all simulation educators who had created one of the educational events evaluated for health literacy component, described in previous section. Three email reminders containing the electronic link to the survey were sent at weekly intervals before the survey was closed.

Results

Literature review

The initial search identified 614 articles (Figure 1). Of those, 70 were excluded as they were duplicates and 544 articles underwent abstract screening. Of the screened abstracts, 423 did not include simulation education with a primary focus that included a health literacy component. Two reviewers performed a full-text review of 121 articles to assess eligibility. Finally, 67 full manuscripts met inclusion criteria and data from these were included in the needs assessment.

Characteristics of included studies

Of the 67 included studies, the majority were published after 2015 (46/67, 69%) and within the United States (44/67, 66%) (Table 2). Of the 49 articles that reported keywords, 17 mentioned health literacy or a PHLC. The majority of studies were cross-sectional in nature (54/67, 81%). There were 10 randomized controlled trials.

Type of learners

Pre-licensure students were the most common learners within simulation educational events (40/67, 60%) with medical students representing the largest proportion (18/40, 45%) (Table 2). Resident physicians were learners for 30% of events (20/67) and fully trained healthcare professionals for 19% of events (13/67). The total learners in all studies numbered 4,316, with 72% (3,114) pre-licensure learners, 18% (789) resident physician learners, 1% (53) fellow physicians and 10% (413) fully trained healthcare professionals (Table 2).

Type of events

The most common goal of simulation educational events was described by authors as rehearsal of 'communication skills' in general (32/67, 48%) (Table 2). All of the articles described involvement of a simulated participant (SP) to interact with learners, and one study had a hybrid simulation design with SPs and a mannequin.

Inclusion of health literacy and prioritized competencies

When prioritized competencies were mentioned verbatim within articles, avoidance of jargon (14/67, 21%) and patient-centred approaches (11/67, 16%) were the most common. No articles mentioned limiting information to 1–3 'need to know' elements (Table 2). It was more common for articles to describe PHLCs in an equivalent language. These articles most often described the concepts of setting a mutual agenda with patients (27/67, 40%), patient-centred approach to asking questions (25/67, 37%) and eliciting patients' full concerns (20/67, 30%). Prioritized competencies were most often incorporated within learning objectives (9 articles verbatim and 25 articles in equivalent language) and learner assessment tools (18 articles verbatim and 33 articles in equivalent language). Eighteen tools were used within the

Table 1: Survey of local simulation educators

Question	Response options
What does the term 'health literacy' mean to you (please write as much as you can explaining your understanding)	Free text
My understanding of the following terms is… Teach-back technique Show me technique Jargon Patient-centred approach Using universal precautions in oral and written communication Establishing a mutual agenda with the patient 'Need to know' or 'need to do' concepts Patient concern	1–5 (5-point Likert scale 1–poor, 5 – excellent)
I have received the following education on health literacy in my career (select all that apply) Undergraduate education – didactics Undergraduate education – PBL, small-group teaching Undergraduate education – simulation Postgraduate education – didactics Postgraduate education – PBL, small-group teaching Postgraduate education – simulation None Professional development in HL (e.g. conference or similar) Other (please specify)	Select all that apply
It is important to incorporate health literacy into simulation education events	1–5 (5-point Likert scale 1 – strongly disagree to 5 – strongly agree)
How often do you incorporate aspects of health literacy into each of these components of simulation education events Learning objectives Case materials and scenario Learner Assessment Course evaluation	1–5 (5-point Likert scale 1 – never to 5 – always)
I have incorporated these components of health literacy into my simulation events Teach-back technique Show me technique Jargon Patient-centred approach Using universal precautions in oral and written communication Establishing a mutual agenda with the patient 'Need to know' or 'need to do' concepts Patient concern	1–5 (5-point Likert scale 1– strongly disagree to 5 – strongly agree)
Health literacy is an important component of the following proportion of simulation events I run/design 0% 1–10% 11–20% 21–50% 51–75% >75%	Select one
Which College do you work in? CON COM CHP COPH COP AA Only Other (please specify)	Select one
What is your academic rank? Not faculty Instructor Assistant Professor Associate Professor Professor Other	Select one

Table 1: Continued

Question	Response options
Which race/ethnicity do you most closely associate with? Asian American Indian or Alaska Native Black or African American Hispanic/Latinx Native Hawaiian or Other Pacific Islander White Two or more races Other (please specify)	Select one
Which gender do you most closely associate with? Female Male Non-binary/third gender Prefer to self-describe Prefer not to say Other	Select one
Any other comments	Free text

studies for learner assessment, the most frequently used being SPIKES (8/18, 44%) [13] and the Roter Interaction Analysis System (3/18, 17%) [14], (Table 2). Representative examples of equivalent language used to describe the PHLCs is shown in Supplementary Material Table 1).

Quality of health literacy components of local simulation education

A total of 881 simulation events were conducted in the 2018–2019 academic year within the UAMS Centers for Simulation Education. After excluding those for which

Figure 1: PRISMA diagram of study flow.

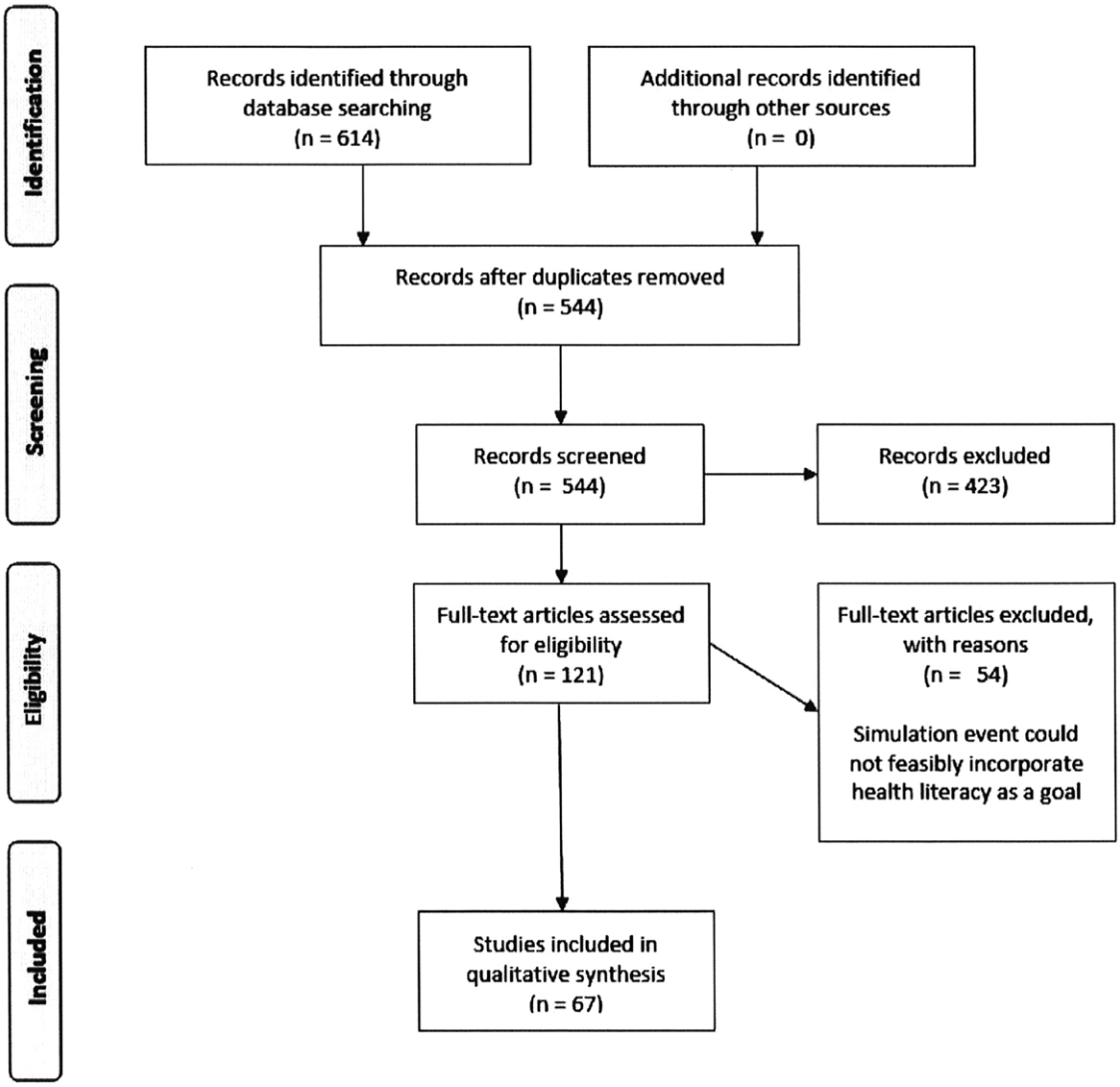

Table 2: Characteristics of included studies

		Number of studies	% Total number of studies
Year	2010–2015	21	31
	2016–2019	31	46
	2020	12	18
	2021	3	5
Continent (some have collaborations and multiple countries)	North America	47	70
	South America	2	3
	Europe	15	22
	Asia	44	66
	Australia	1	1
Type of institution	Single	64	96
	Multi	3	4
Type of study	Cross-sectional	54	81
	Randomized controlled trial	10	15
	Cohort	2	3
	Case-controlled	1	1
Type of learners	Medical students	18	27
	Nursing/APN/NP students	10	15
	RT students	1	1
	Language students	2	3
	Dental students	5	7
	Pharmacy students	2	3
	Optometric students	1	1
	Health professions students	1	1
	Resident physicians	20	30
	Fellow physicians	3	4
	Attending physicians	3	4
	Physician assistants	2	3
	Nurses/nurse practitioners	4	6
	Respiratory therapists	1	1
Number of learners			(% total number of learners, 4,316)
	Medical students	1780	41
	Nursing/APN/NP students	722	17
	RT students	20	1
	Language students	61	1
	Dental students	395	9
	Pharmacy students	126	3
	Optometric students	10	1
	Resident physicians	789	18
	Fellow physicians	53	12
	Attending physicians	217	5
	Physician assistants	39	1
	Nurses/nurse practitioners	101	2
	Respiratory therapists	3	1

Table 2: Continued

		Number of studies	% Total number of studies
Focus of the simulation education	Shared decision-making	5	7
	Breaking bad news	4	6
	'Communication skills'	32	48
	'Patient-centred communication'	13	19
	Communication skills with language barriers	4	6
	Plain language communication skills	2	3
	Teach back	2	3
	Health literacy	1	1
	Addressing social needs	1	1
	Motivational interviewing	2	3
	Educating patients	1	1
Type of simulation	Simulated participant	66	99
	Mannequin	2	3
Tools used for assessment of learners	Roter interaction analysis system	3	4
	SPIKES	8	12
	WEMS technique (waiting, echoing, mirroring and summarizing)	1	1
	NURSE model (naming, understanding, respecting, supporting and exploring empathy)	2	3
	CEL competencies (control, explaining, listening and influencing)	1	1
	Self-efficacy in patient-centredness questionnaire	1	1
	SEGUE (set the stage, elicit information, give information, understand the patients perspective and end the encounter)	1	1
	Calgary Cambridge Observation guide	2	3
	American Board of Internal Medicine Assessment of Communication skills	1	1
	Communication Assessment Tool	5	7
	Consultation and Relational Empathy (CARE)	1	1
	Perception of Patient-Centredness (PPC)	1	1
	Jefferson Scale of Physician Empathy (JSPE)	1	1
	Perception of Patient-Centredness (PPC)	1	1
	Common Ground Assessment	1	1
	Kalamazoo Essential Elements Communication	1	1
	Gap Kalamazoo assessment	1	1
	Four habits coding scheme	2	3
Coleman's 'prioritized health literacy competency' (PHLC) mentioned verbatim	Teach back/show me	7	10
	Jargon	14	21
	Patient-centred	11	16
	Universal precautions	1	1
	Interpreter	4	6
	Mutual agenda	4	6
	Need to know/need to do	0	0
	Patient concerns	8	12

Table 2: Continued

		Number of studies	% Total number of studies
Coleman's 'prioritized health literacy competency' (PHLC) mentioned in equivalent language	Teach back/show me	8	12
	Jargon	12	18
	Patient-centred	25	37
	Universal precautions	0	0
	Interpreter	2	3
	Mutual agenda	27	40
	Need to know/need to do	3	4
	Patient concerns	20	30

assessment of health literacy component was inappropriate (e.g. pure technical skills training with psychomotor learning objectives), and removal of duplicate events, 57 discrete simulation events were included in analysis (Table 3).

The content of the identified events ranged from scenarios related to end of life (e.g. death and dying, palliative care and breaking bad news), those related to communication of error or adverse events, communication challenges (e.g. genetic counselling, communication events with diverse underrepresented minority patient populations), sexual assault and mental health issues (e.g. depression). The events were created and delivered by the College of Medicine for 49% (28/57), College of Nursing for 5% (3/57), College of Health Professions for 28% (16/57), College of Pharmacy for 9% (5/57) and Office of Interprofessional Education for 8% (4/57). Reference to health literacy and to the PHLCs was found within at least one part of the written components of the simulation curriculum, for 23/57 events (40%). These events either described the PHLC in the language of Coleman [8] or in equivalent language (Supplementary Material Table 2). The PHLC most commonly described in equivalent language was avoidance of jargon, establishing a mutual agenda and eliciting full concerns.

When a PHLC was referenced within the learning objectives this was most likely to be related to avoidance of jargon (7/57, 12%) or provision of patient or family-centred care (7/57, 12%). For the seven learning events that described patient-centred care within their learning objectives they provided the term 'patient-centred care' only and did not expand upon this with the Coleman's descriptor 'what questions do you have?', rather than 'do you have any questions?' [8]. SP materials and course evaluations rarely contained any mention of health literacy or PHLC. Learner assessments more commonly included items related to PHLCs and most often related to avoidance of jargon (15/30, 50%) or eliciting full list of patient concerns (11/30, 37%). The PHLC, 'universal precautions with written and oral materials' was never mentioned in any written materials pertaining to local simulation events (Table 4).

Knowledge, attitudes and beliefs of stakeholders

Survey response rate was 77% (17/22). The majority of educators were from the College of Medicine 11 (65%), with 2 from the College of Pharmacy (12%), 2 from the College of Health Professions, 1 (6%) from the College of Nursing and one other educator. In terms of academic position, 2 were Professors (12%), 8 Associate Professors (47%), 5 Assistant Professors (29%), one Instructor (6%) and one non-faculty member (6%). Two respondents identified as Asian (12%), one Black or African American (6%) and 14 White (82%). Eleven respondents (65%) identified as female and 6 as male (35%). When asked 'What does the term 'health literacy' mean to you', three educators demonstrated 'comprehensive understanding' in their response, two 'moderate understanding' and 12 'limited understanding'. Representative quotes include:

> Comprehensive '*It is how one goes about obtaining healthcare then processing information to make decisions for one's wellness. If a patient doesn't understand treatment options because they were explained using medical jargon it can/will affect their decision regarding his/her treatment.*'
>
> Moderate '*Health Literacy is the capacity of an individual to obtain, process and understand basic health information to make informed decisions and adhere to them.*'
>
> Limited '*A persons working understanding and ability to learn about their health and factors that affect it.*'

With regard to the understanding of specific health literacy terms, respondents expressed most understanding of the concepts 'jargon' (mean Likert score 4.6 on a 0–5 scale), 'establishing a patient-centred approach' (4.6) and 'establishing a mutual agenda' (4.5). Respondents reported understanding 'using universal precautions in written and oral communication' (3.3) and 'need to know or need to do concepts' (3.4) least well. Three respondents (19%) had received simulation education pertaining to health literacy as part of their undergraduate training, and half of all respondents had received simulation health literacy training as a postgraduate learner. The majority of simulation educators (82%) agreed with the statement 'it is important to incorporate health literacy into simulation educational events'. Three educators strongly disagreed with this statement. Seven educators (41%) felt that health literacy was an important component in more than half of all the simulation events they conduct. Most (60%) of educators felt that less than half of the events they currently deliver that did not include health literacy would benefit from inclusion of this topic.

Table 3: Details of local simulation events included in analysis

Simulation event	Description, type of simulation	Type of learner/level, size of participation groups
Pre-operative assessment of Jehovah's witness patient	Simulated patient. Patient who will have a hip replacement and their daughter undergo pre-operative counselling.	Anaesthesia residents 14 learners, work in pairs
Pre-operative assessment of HIV-positive patient	Simulated patient. HIV-positive patient and her preacher, for pre-operative counselling.	Anaesthesia residents 14 learners, work in pairs
Mock American Board of Anesthesiology (ABA) Objective Structured Clinical Examination (OSCE) consent	Simulated patient. Pre-operative assessment of patient requiring surgery for wrist fracture, mother has MH history.	Anaesthesia residents 16 learners
Mock ABA OSCE headache	Simulated patient. Post delivery with epidural and requires a blood patch.	Anaesthesia residents 16 learners
Breaking bad news	Simulated patient. Patient with breast cancer metastasized to eye and brain.	Ophthalmology residents 4 learners
Stroke	Simulated patient. Patient presents with right-sided weakness.	Neurology residents 4 learners
Appendicitis	Simulated patient. Right-sided abdominal pain and fever.	Medical students, year 1 Entire class (approx. 177), work in groups of six
Gastroenteritis	Simulated patient. Vomiting.	Medical students, year 1 Entire class (approx. 177), work in groups of six
Pancreatitis	Simulated patient. Central abdominal pain radiating through to back.	Medical students, year 1 Entire class (approx. 177), work in groups of six
Anaemia	Simulated patient. Lethargy, poor exercise tolerance, fatigue, menorrhagia.	Medical students, year 1 Entire class (approx. 177), work in groups of six
Depression	Simulated patient. Previous road traffic collision, low mood, poor appetite, learners investigate whether accident was in fact intentional.	Medical students, year 1 Entire class (approx. 177), work in groups of six
Acute coronary syndrome	Simulated patient. Central chest pain and shortness of breath.	Rising intern preparation week, medical students, year 4 Entire class (approx. 177), work in groups of ten (zoom and in person)
Stroke	Simulated patient. Facial weakness and left-sided arm and leg weakness.	Rising intern preparation week, medical students, year 4 Entire class (approx. 177), work in groups of ten (Zoom and in person)
Death and dying	Simulated family caregivers. Brother and sister disagree about end-of-life care for their father.	Elective for medical students, year 4 13 learners, 2 participated in simulation, remaining observers
End of life	Simulated patient. Father with metastatic lung cancer, discussion with him and the daughter about advanced directives and end of life care.	Oncology fellows 3 learners
Breaking bad news	Simulated patient. Patient with breast cancer and post-chemotherapy has haemoptysis and lung metastases.	Oncology fellows 3 learners
Patient safety	Manikin [with faculty voice over]. Patient with multiple safety issues e.g. bedrails down, cannula upside down, unsheathed needle on table, trip hazard.	Physician assistant students, year 1 36 learners, groups of 3
Medical error	Manikin [with faculty voice over]. Wrong name on wristband, Coumadin error.	Physician assistant students, year 1 36 learners, groups of 3
Patient education	Manikin [with faculty voice over]. Patient with pyelonephritis and uncontrolled diabetes, counselling occurs.	Physician assistant students, year 1 36 learners, groups of 3

Table 3: Continued

Simulation event	Description, type of simulation	Type of learner/level, size of participation groups
Care of the elderly patient	Simulated patient. Patient newly diagnosed diabetic preparing for discharge, discharge planning.	Nursing students, year 1 120 learners, groups of 3
Asthma	Simulated family caregiver and pediatric manikin, telemedicine. Child has asthma attack in grandma's care and care team communicate via telehealth.	Nursing students, year 2 120 learners, groups of 12 (mix of participants and observers)
Palliative care	Simulated patient. Lung cancer, new mass in spleen and meeting for discussion of pain management.	Elective for pharmacy students, year 3 4 learners
Arkansas Regional Organ Recovery Agency (ARORA)	Simulated family caregiver. Wife of brain dead patient and discussion regarding organ donation.	Family services coordinator trainee 1 learner
Clinical practice	Simulated family caregiver. Parent on telephone, triage assessment of pediatric patient on the phone.	Medical students, year 3 173 students approx. 1 learner at a time
Clinical practice	Simulated patient. Patient with generalized pain, student performs assessment and differential	Medical students, year 3 173 students approx. 1 learner at a time
Clinical practice	Simulated patient. Patient with low mood and alcohol excess, student performs assessment and counselling.	Medical students, year 3 173 students approx. 1 learner at a time
Clinical practice	Simulated patient. Patient has shortness of breath, recent surgery, student performs assessment and differential diagnosis.	Medical students, year 3 173 students approx. 1 learner at a time
Clinical practice	Simulated patient. Patient has headache, student performs assessment and differential diagnosis.	Medical students, year 3 173 students approx. 1 learner at a time
Transitional residents	Simulated patient. Patient has nausea, diarrhoea, resident performs assessment.	Internal medicine residents, PGY-1 6 residents
Transitional residents	Simulated patient. Patient has cough and fever, resident performs assessment.	Internal medicine residents, PGY-1 6 residents
Pharmaceutical practice and assessment	Simulated patients. Six family members, students engage with family members to elicit medical history.	Pharmacy students, year 3 80 students
Sexual assault nurse examiners (SANE)	Simulated patient. Learners interact with simulated patient to assess and perform physical examinations.	Nurses 10–15 learners
Patient and family-centred care	Simulated family caregiver. Relative of patient with adverse event during dental procedure.	Interprofessional team of learners from multiple colleges – medicine, nursing, pharmacy, health professions, public health Variable, usually 4–6 learners in a group
Palliative care	Simulated patient and family caregiver. Patient has terminal cancer and is requesting discussion of assisted dying. Nurse has concerns regarding medication administration.	Palliative care fellows 3 learners
Communication	Simulated patient. Patient is picking up a prescription but is late filling another prescription, student uses motivational interviewing techniques to discover issues leading to this.	Pharmacy students, year 2 60 students
Communication	Simulated provider. Student calls physician to request an alternative medication for a patient.	Pharmacy students, year 2 60 students

Table 3: Continued

Simulation event	Description, type of simulation	Type of learner/level, size of participation groups
Communication	Simulated patient. Student performs medical therapy management.	Pharmacy students, year 2 60 students
Diverse populations	Simulated patient. Patient has low health literacy, discussion of social determinants of health care.	Medical students, year 1 173 students
Diverse populations	Simulated patient. Patient is diabetic and fasting for cultural reasons, discussion of social determinants of health care.	Medical students, year 1 173 students
Depression	Simulated patient. Low mood.	Medical students, variable years
Communication	Simulated patient. Mouth pain.	Dental residents, PGY-1 5 total learners, 2–3 learners with each SP
Communication	Simulated patient. Chronic mouth bleeding.	Dental residents, PGY-1 5 total learners, 2–3 learners with each SP
Communication	Simulated patient. Abdominal pain and bloody diarrhoea.	Dental residents, PGY-1 5 total learners, 2–3 learners with each SP
Genetic counselling	Simulated patient. Patient with neurofibromatosis, counselling.	Genetic counselling students, graduate 5 learners
Genetic counselling	Simulated patient. Patient with amniocentesis high probability of Down's syndrome, counselling.	Genetic counselling students, graduate 5 learners
Genetic counselling	Simulated family caregiver. Father of patient with Pendred syndrome, counselling and patient education.	Genetic counselling students, graduate 5 learners
Genetic counselling	Simulated patient. Patient with breast cancer diagnosis, discussion of screening and genetic risk.	Genetic counselling students, graduate 5 learners
Genetic counselling	Simulated patient. Patient with abnormal results from amniocentesis indicating Trisomy 18, counselling.	Genetic counselling students, graduate 5 learners
Genetic counselling	Simulated patient and family member. Patient and daughter for discussion of cancer pedigree, counselling.	Genetic counselling students, graduate 5 learners
Communication	Simulated patient. Diabetic patient, nutritional education.	Dietetic students, graduate 8–9 learners, interact with SP one on one.
Communication	Simulated patient. Coeliac disease, nutritional education.	Dietetic students, graduate 8–9 learners, interact with SP one on one.
Communication	Simulated patient and family caregiver. Patient with history of cardiac disease and his wife, nutritional education.	Dietetic students, graduate 8–9 learners, interact with SP one on one.
Communication	Simulated patient. Young patient with risk factors for cardiovascular disease, nutritional education.	Dietetic students, graduate 8–9 learners, interact with SP one on one.
Difficult communication	Simulated patient. Angry patient who requires de-escalation.	Medical student, year 2 173 students
Difficult communication	Simulated patient. Patient with newly found lump on breast, highly emotional.	Medical student, year 2 173 students
Adverse event	Simulated family caregiver. Relative of patient who experienced adverse event during ICU admission.	Interprofessional team of learners from multiple colleges – medicine, nursing, pharmacy, health professions, public health Variable, usually 4–6 learners in a group
Dental health	Simulated patient. Sore mouth, for telehealth assessment	Interprofessional team of learners from multiple colleges – medicine, nursing, pharmacy, health professions, public health Variable, usually 4–6 learners in a group

Table 4: Description of health literacy and PHLCs within written materials associated with local simulation educational efforts for healthcare professional curricula (verbatim and equivalent language)

Written course materials	States 'health literacy'	'Teach back' or 'show me' techniques	Avoids jargon	Patient-centred	Universal precautions with written or oral materials	Recommends appropriate use of interpreter	Establishing a mutual agenda	1–3 need to know or need to do concepts	Elicits full list of patient concerns at the outset of encounter
Learning objectives	5/57 (9%)	3/57 (5%)	7/57 (12%)	7/57 (12%)	0/57	0/1 (NA for 56/57 events)	12/57 (21%)	3/57 (5%)	3/57 (5%)
Standardized patient materials	1/57 (2%)	0/57	1/57 (2%)	0/57	0/57	0/1 (NA for 56/57 events)	0/57	0/57	0/57
Learner assessment (if applicable)	1/30 (3%)	0/30	15/30 (50%)	9/30 (30%)	0/30	0/1 (NA for 56/57 events)	7/30 (23%)	1/30 (3%)	11/30 (37%)
Course evaluation	0/57	0/57	0/57	0/57	0/57	0/1 (NA for 56/57 events)	0/57	0/57	0/57

Discussion

Understanding health literacy and successful approaches to effectively educate healthcare professionals in this area is crucial to improve health and reduce health disparities. The multi-modal needs assessment herein demonstrates areas within simulation education that require improvement, pertaining to both understanding and defining health literacy and to intentional incorporation of health literacy prioritized competencies into these learning events. A common language and understanding between educators of events incorporating health literacy learning objectives are essential. This enables subject matter competency levels for educators to be clearly defined and measured. Consistency in language also allows educational research to be published using common language, strengthening the field by enabling synthesis of multiple educational reports.

Simulation education is a powerful active learning strategy enabling learners the opportunity for deliberate practice to improve patient care. Communication skills can be effectively rehearsed through this pedagogy as simulated experiences with standardized patients provide opportunities to practice and receive feedback. Crucial to this integration is understanding of health literacy and core concepts by simulation educators. Current literature demonstrates that although opportunities exist to include elements of health literacy education, established PHLCs are not routinely incorporated into simulation events. This is demonstrated by the fact that, within the currently published literature, health literacy or Coleman's prioritized competencies [8] were mentioned verbatim in only 28/67 papers in which a simulation event could have been reasonably expected to incorporate them. In comparison, the PHLCs were mentioned in equivalent language in 53/67 articles. The work of Grayson-Sneed et al. provides an excellent example of optimal inclusion of health literacy competencies, in which medical residents were taught patient-centred interviewing to provide education regarding smoking cessation [16]. Here the authors describe 'States the agenda within the first 5 minutes, asking if there is "anything else"' and 'Uses open-ended skills to elicit personal issues around smoking or other personal, non-emotional issues'. They identify not only the importance of the learner demonstrating the competency but also the timing of this within the patient–provider interaction, which is crucial.

Simulation educators within the published literature did however describe prioritized health competencies in their own words for a greater number of events, especially relating to jargon, patient-centred approaches and eliciting patient concerns. This demonstrates that while these concepts are being structured within selected events, language and terminology used around these are not formalized. An illustrative example is the work of Brommelseiek et al. who describe education for nurse practitioner (NP) students within a 16-week rural immersion experience involving simulation [34]. While the authors state in the goals and design of the study an aim to develop 'health literacy skills using evidence-based methods to assist students with clear and concisely communicated care plans', they do not mention any of the competencies within the article verbatim, and use equivalent language only. This makes it challenging to both establish current practices and recommend best practices within this area. Through this scoping review, we identify a need to clearly describe how health literacy components are incorporated within simulation education, through a common language.

When examining local educational events at our institution, a similar pattern to that seen within the published literature was observed. Of the 57 events for which inclusion of PHLCs was appropriate, only 23 included one or more in formal course documentation. Of the eight PHLCs, one (universal precautions for written and oral materials) was not formally included in any of the events and only one (avoids jargon) was included in half or more of events. Again, we noted that fewer events described PHLCs verbatim than with equivalent language. Learning objectives were the element of the educational materials that were most likely to describe health literacy competencies verbatim, with 1 in 10 events doing so. Equivalent language for the PHLCs used by educators was found in 21 of the 57 events and observed most often in learner assessments. This suggests that while a common language is not being used, there is understanding of the importance of incorporation of health literacy within these simulation educational events that have a communication focus. Addressing these perceptions of competencies and formalization of language used is important in professional development for simulation educators. These observations from analysis of local events are aligned with perceptions of our institution's simulation educators, the majority of whom believe that it is important to incorporate elements of health literacy into simulation educational events. However, we found that 1 in 4 local simulation educators reported they were not routinely incorporating this into their simulations. The incorporation of health literacy into events relies upon clear and common language to describe the goals and measure outcomes. The current literature review and surveys identify areas that should inform development of education for simulation faculty, namely regarding concepts of 'using universal precautions in written and oral communication' and 'need to know or need to do concepts' which were both least well understood and least incorporated into the published simulation education. A strategy that may be most likely to encourage and foster formalization of language for educators in this area is for Coleman's PHLCs to be incorporated into the competency frameworks of regulatory and accreditation bodies. We recognize that curriculum design efforts are often aligned with program accreditation, and set by these accreditation bodies. This may enable a more widespread adoption of this terminology and focus the lens of simulation educators within this area. This is a similar approach to areas of focus such as interprofessional education that set adoption of competency standards and definitions from expert panels such as the Interprofessional Education Collaborative, the World Health Organization, or The Centre for the Advancement of Interprofessional Education. Adoption by accreditors of standardized nomenclature has the added benefit to enhance development of cross-discipline training which increases

knowledge and application for PHLC's not only for a learner's individual discipline but also provides foundation to engage in collaborative planning or practice to identify consistency of message or efficiency of conversation in patient visits or care plans involving more than one profession.

Since the launch of our Center for Health Literacy in 2014, much has been done to engage campus units in recognizing the critical role health literacy plays in facilitating equitable health outcomes and a favourable patient experience while also impacting healthcare costs. These concepts have been introduced at numerous faculty development events, and health literacy is the first concept to be woven into students' interprofessional education curriculum longitudinally. In addition, health literacy is introduced in curricula in several of our colleges. We anticipate that these efforts have raised sufficient awareness among faculty, including simulation educators, to more formally integrate health literacy competencies into simulation education and allow students ample opportunity to practice these communication skills. While growing awareness of the importance of these skills may transfer sporadically to simulation learning events as motivated faculty and students recall previous exposure, to ensure continuity among faculty, standardized patients, and sessions, health literacy competencies must be deliberately included in written materials that support each event (e.g. scripting for standardized patients and formal learner assessments).

Learners identified within the published literature were mainly pre-licensure students, outnumbering postgraduate learners with a ratio of 3:1. This demonstrates a critical need to imbue simulation educators with the tools required to embed health literacy education within their curricula. To illustrate this, learners within the identified literature who could perform an educator role (i.e. attending physicians, nurses, nurse practitioners and respiratory physiotherapists) represented less than 10% of the total participant group. We suggest the development of a longitudinal curriculum for healthcare professions faculty addressing the PHLCs, followed by a 'train the trainers' component advising educators on ways to incorporate these elements into simulation learning event design. In addition, by teaching the concepts of health literacy to simulation educators, we can equip them to place the various PHLCs appropriately within the learning events. We can ensure that the timing of the delivery of education within the longitudinal curriculum is appropriate for students and also aligned with the most appropriate pedagogy. Through faculty development initiatives, simulation educators can be encouraged to talk about health literacy as an educational priority, model this for their students and enable a robust simulation experience for all. Increasing the prevalence of health literacy educational events may be important to stimulate culture change in this area and, by extension, address healthcare disparities and inequity.

Our work has limitations. With regard to the general needs assessment, it is possible that the literature review missed some articles that discussed health literacy or related components within the text and not within the abstract or title. To minimize this possibility, we expanded our search terms beyond 'health literacy' to include all of the PHLCs and as such it is unlikely that we missed a large body of work or articles that would be accessible to a researcher interested in this topic. Additionally, only certain types of articles detailed all of the case materials within the events reported (i.e. those published in MedEdPortal). The quality of the data collection for the literature review is therefore limited by the data included within the manuscript. It is possible that we have underestimated the content pertaining to health literacy and the PHLCs as the materials themselves were not always provided, especially SP materials. Despite this, we believe it is unlikely that the concept of health literacy or related competencies were a prominent feature of the event design and not mentioned within the manuscript. Further, we recognize that not all simulation events should be expected to include all PHLCs. For example, a session focused on breaking bad news would prioritize other learning objectives (i.e. demonstration of empathy, concern and understanding of grief reactions). However, some authors were still able to incorporate PHLCs in these instances, thus demonstrating that these can be integrated into a variety of events, even for those involving sensitive subject matter. Additionally, although our review identified those articles pertaining to health literacy or PHLCs in simulation education, there is no published work to demonstrate that education on this topic improves patient outcomes. However, we do not anticipate that we are overestimating the importance of this education, as numerous studies have demonstrated improvement in patient outcomes in relation to practice of these skills [35–38]. Accordingly, we may extrapolate that improved educational experiences may increase the frequency of PHLC incorporated into clinical practice and thus improve relevant patient outcomes. To address this, in the future we seek to determine the effect of our faculty educational program and subsequent simulation education on patient care.

With regard to the targeted needs assessment, our analysis of recent simulation courses relied on written documentation for each course, and that written guidance may not fully reflect whether the targeted competencies are addressed in a given course. Despite this, those written materials are what the simulation centre staff and standardized patients work from when delivering the education and therefore should be explicit in their aims to optimize the likelihood that they are routinely addressed by facilitators, students and standardized patients. We plan to address this limitation in future studies including observation of simulation events. Finally, both our assessment of course materials and our survey of simulation educators were limited to a single academic institution. While this may limit extrapolation of our findings to other centres, we are aware of few institutions with robust centres for both health literacy and simulation learning and thus anticipate that most institutions have substantial opportunity to strengthen their efforts in this area.

Future work will be directed at development of recommendations for health literacy simulation education to establish 'best practices' for effective incorporation of prioritized health literacy competencies into simulation events. Specifically, we will perform qualitative analysis to explore perceptions and beliefs around this area in more depth and will pilot a local curriculum based on these needs

assessment data, performing critical analysis of efficacy and continuing the programmatic development process.

Conclusions

Needs assessment of simulations involving health literacy has identified a critical need to formalize and standardize the language used by educators on this topic and to provide faculty education pertaining to the prioritized healthy literacy competencies. A cohesive, interprofessional approach, framed by the international simulation standards, may assist faculty in developing simulation events embedding Coleman's prioritized competencies of health literacy within these learning experiences and create a framework to align simulation learning methodology within competency development for health literacy skills.

Supplementary material

Supplementary data are available at *The International Journal of Healthcare Simulation* online.

Declarations

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Authors' contributions

The authors confirm contribution to the paper as follows: study conception and design: KJD, AC; data collection: KJD, SJ, AC, PdG; analysis and interpretation of results: KJD, AC, PdG, SJ; draft manuscript preparation: KJD, AC, PdG; revision of manuscript: KJD, AC, SJ, TH, KN. All authors reviewed the results and approved the final version of the manuscript.

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Availability of data and materials

None declared.

Ethics approval and consent to participate

The work was reviewed by the local Institutional Review Board and deemed not human research due to the quality improvement focus.

Competing interests

None declared.

References

1. Office of Disease Prevention & Health Promotion, U.S. Department of Health & Human Services. Health literacy in healthy people 2030. 2020. Available from: https://health.gov/our-work/healthy-people/healthy-people-2030/health-literacy-healthy-people-2030 [Accessed 13 September 2021].
2. Kutner, M, Greenburg E, Jin Y, Paulsen C, White S. The health literacy of America's adults: results from the 2003 National Assessment of Adult Literacy. Washington, DC: National Center for Education Statistics, U.S. Department of Education. 2003. Available from: https://nces.ed.gov/pubs2006/2006483.pdf [Accessed 13 September 2021].
3. Berkman ND, Sheridan SL, Donahue KE, Halpern DJ, Crotty K. Low health literacy and health outcomes: an updated systematic review. Annals of Internal Medicine. 2011;155(2):97–107
4. McNaughton CD, Cawthon C, Kripalani S, Liu D, Storrow AB, Roumie CL. Health literacy and mortality: a cohort study of patients hospitalized for acute heart failure. Journal of the American Heart Association. 2015;4(5):e001799.
5. Bostock S, Steptoe A. Association between low functional health literacy and mortality in older adults: longitudinal cohort study. British Medical Journal. 2012;344:e1602.
6. The Joint Commission. "What did the doctor say?" Improving health literacy to protect patient safety. 2007. Available from: https://www.jointcommission.org/-/media/deprecated-unorganized/imported-assets/tjc/system-folders/assetmanager/improving_health_literacypdf.pdf?db=web&hash=32078FE2F92B09026044BEA48ABC14BE [Accessed 13 September 2021].
7. Liang L, Brach C. Health literacy universal precautions are still a distant dream: analysis of U.S. Data on health literate practices. Health Literacy Research and Practice. 2017;1(4):e216–e230. doi: 10.3928/24748307-20170929-01
8. Coleman C, Hudson S, Pederson B. Prioritized health literacy and clear communication practices for health care professionals. Health Literacy Research and Practice. 2017;1(3):e91–e99. doi: 10.3928/24748307-20170503-01
9. Coleman CA, Hudson S, Maine LL. Health literacy practices and educational competencies for health professionals: a consensus study. Journal of Health Communication. 2013;18 (Suppl 1):82–102. doi: 10.1080/10810730.2013.829538
10. Sizemore JN, Kurowski-Burt A, Evans K, Hoffman A, Summers A, Baugh GM. Interdisciplinary education apartment simulation (IDEAS) project: an interdisciplinary simulation for transitional home care. MedEdPORTAL. 2021;17:11111. doi: 10.15766/mep_2374-8265.11111
11. Karpa K, Graveno M, Brightbill M, et al. Geriatric assessment in the primary care environment: a standardized patient case activity for interprofessional students. MedEdPORTAL. 2019;15:10844. doi: 10.15766/mep_2374-8265.10844
12. Thomas PA, Kern DE, Hughes MT, Chen BY. Curriculum development for medical education: a six-step approach. Johns Hopkins University Press. 2015.
13. Baile WF, Buckman R, Lenzi R, Glober G, Beale EA, Kudelka AP. SPIKES-A six-step protocol for

delivering bad news: application to the patient with cancer. Oncologist. 2000;5(4):302–311. doi: 10.1634/theoncologist.5-4-302
14. Roter D, Larson S. The Roter interaction analysis system (RIAS): utility and flexibility for analysis of medical interactions. Patient Education and Counseling. 2002;46(4):243–251. doi: 10.1016/s0738-3991(02)00012-5
15. Awdish RL, Buick D, Kokas M, Berlin H, Jackman C, Williamson C, Mendez MP, Chasteen K. A Communications bundle to improve satisfaction for critically ill patients and their families: a prospective, cohort pilot study. Journal of Pain and Symptom Management. 2017;53(3):644–649. doi: 10.1016/j.jpainsymman.2016.08.024
16. Grayson-Sneed KA, Smith RC. A research coding method to evaluate a smoking cessation model for training residents—a preliminary report. Patient Education and Counseling. 2018;101(3):541–545. doi: 10.1016/j.pec.2017.09.010
17. Newcomb A, Trickey AW, Lita E, Dort J. Evaluating surgical residents' patient-centered communication skills: practical alternatives to the "apprenticeship model". Journal of Surgical Education. 2018;75(3):613–621. doi: 10.1016/j.jsurg.2017.09.011
18. Chou WY, Han P, Pilsner A, Coa K, Greenberg L, Blatt B. Interdisciplinary research on patient-provider communication: a cross-method comparison. Communications Medicine. 2011;8(1):29–40. doi: 10.1558/cam.v8i1.29
19. Majid S, Gauguet JM, McIntosh L, Watts G, Rosen MP, DeBenedectis CM. Still coming out of the dark: enduring effects of simulation-based communication skills training for radiology residents-four-year follow-up. Current Problems in Diagnostic Radiology. 2020;49(6):382–385. doi: 10.1067/j.cpradiol.2019.07.006
20. Anderson HA, Young J, Marrelli D, Black R, Lambreghts K, Twa MD. Training students with patient actors improves communication: a pilot study. Optometry and Vision Science. 2014;91(1):121–128. doi: 10.1097/OPX.0000000000000112. PMID: 24212190
21. Trickey AW, Newcomb AB, Porrey M, Piscitani F, Wright J, Graling P, Dort J. Two-year experience implementing a curriculum to improve residents' patient-centered communication skills. Journal of Surgical Education. 2017;74(6):e124–e132. doi: 10.1016/j.jsurg.2017.07.014
22. Seeberg MS, Scarbecz M, Hottel TL. An innovative behavioral science curriculum at the University of Tennessee College of Dentistry. The Journal of the Tennessee Dental Association. 2013;93(1):31–37; quiz 38–39.
23. Schmitz FM, Schnabel KP, Bauer D, Woermann U, Guttormsen S. Learning how to break bad news from worked examples: Does the presentation format matter when hints are embedded? Results from randomised and blinded field trials. Patient Education and Counseling. 2020;103(9):1850–1855. doi: 10.1016/j.pec.2020.03.022
24. Son HK, Hee Kim D. Effect of SEGUE-based communication education on nursing simulation practice: a quasi-experimental design. Contemporary Nurse. 2019;55(4–5):330–340. doi: 10.1080/10376178.2019.1641421
25. Chéret A, Durier C, Noël N, Bourdic K, Legrand C, D'Andréa C, Hem E, Goujard C, Berthiaume P, Consoli SM. Motivational interviewing training for medical students: a pilot pre-post feasibility study. Patient Education and Counseling. 2018;101(11):1934–1941. doi: 10.1016/j.pec.2018.06.011
26. Müller E, Diesing A, Rosahl A, Scholl I, Härter M, Buchholz A. Evaluation of a shared decision-making communication skills training for physicians treating patients with asthma: a mixed methods study using simulated patients. BMC Health Services Research. 2019;19(1):612. doi: 10.1186/s12913-019-4445-y
27. Natt N, Starr SR, Reed DA, Park YS, Dyrbye LN, Leep Hunderfund AN. High-Value, cost-conscious communication skills in undergraduate medical education: validity evidence for scores derived from two standardized patient scenarios. Simulation in Healthcare. 2018;13(5):316–323. doi: 10.1097/SIH.0000000000000316
28. Vail L, Sandhu H, Fisher J, Cooke H, Dale J, Barnett M. Hospital consultants breaking bad news with simulated patients: an analysis of communication using the Roter Interaction Analysis System. Patient Education and Counseling. 2011;83(2):185–194. doi: 10.1016/j.pec.2010.05.016
29. Bosse HM, Schultz JH, Nickel M, Lutz T, Möltner A, Jünger J, Huwendiek S, Nikendei C. The effect of using standardized patients or peer role play on ratings of undergraduate communication training: a randomized controlled trial. Patient Education and Counseling. 2012;87(3):300–306. doi: 10.1016/j.pec.2011.10.007
30. Junod Perron N, Nendaz M, Louis-Simonet M, Sommer J, Gut A, Cerutti B, van der Vleuten CP, Dolmans D. Impact of postgraduate training on communication skills teaching: a controlled study. BMC Medical Education. 2014;14:80. doi: 10.1186/1472-6920-14-80
31. McKenzie CT, Tilashalski KR, Peterson DT, White ML. Effectiveness of standardized patient simulations in teaching clinical communication skills to dental students. Journal of Dental Education. 2017;81(10):1179–1186. doi: 10.21815/JDE.017.075
32. Lucander H, Knutsson K, Salé H, Jonsson A. "I'll never forget this": evaluating a pilot workshop in effective communication for dental students. Journal of Dental Education. 2012;76(10):1311–1316.
33. Sangappa SB, Tekian A. Communication skills course in an Indian undergraduate dental curriculum: a randomized controlled trial. Journal of Dental Education. 2013;77(8):1092–1098.
34. Brommelsiek M, Peterson JA. Preparing nurse practitioner students to practice in rural primary care. Journal of Nursing Education. 2020;59(10):581–584. doi: 10.3928/01484834-20200921-08
35. Beauchamp A, Talevski J, Niebauer J, Gutenberg J, Kefalianos E, Mayr B, Sareban M, Kulnik ST. Health literacy interventions for secondary prevention of coronary artery disease: a scoping review. Open Heart. 2022;9(1):e001895. doi: 10.1136/openhrt-2021-001895
36. Bates OL, O'Connor N, Dunn D, et al. Applying STAAR interventions in incremental bundles: improving post-CABG surgical patient care. Worldviews on Evidence-Based Nursing. 2014;11:89–97.
37. Shen Z, Jiang C, Chen L. Evaluation of a train-the-trainer program for stable coronary artery disease management in community settings: a pilot study. Patient Education and Counseling. 2018;101:256–65.
38. Allenbaugh J, Corbelli J, Rack L, Rubio D, Spagnoletti C. A brief communication curriculum improves resident and nurse communication skills and patient satisfaction. Journal of General Internal Medicine. 2019;34(7):1167–1173.

APPENDIX 1

PubMed

education, professional[mesh] AND simulation AND (“health literacy” OR “health literate” OR plain[tiab] OR “teach back”[tiab] OR jargon[tiab] OR “open ended question*”[tiab] OR “patient centered”[tiab] OR “show me”[tiab] OR interpreter[tiab] OR “mutual agenda”[tiab] OR “negotiating agenda”[tiab] OR “limiting information”[tiab] OR “need to know”[tiab] OR “need to do”[tiab]) Filters: in the last 10 years, English Sort by: Most Recent

CINAHL

simulation* AND ((MH education, health sciences+ OR “patient education”) AND AB (“health literacy” OR “health literate” OR plain OR “teach back” OR jargon OR “open ended question*” OR “patient centered” OR “show me” OR interpreter OR “mutual agenda” OR “negotiating agenda” OR “limiting information” OR “need to know” OR “need to do” OR (MM communication))

PsycINFO

(simulation* AND education) AND (“health literacy” OR “health literate” OR plain OR “teach back” OR jargon OR “open ended question*” OR “patient centered” OR “show me”