Health-Literacy Training for First-Year Respiratory Therapy Students: A Mixed-Methods Pilot Study

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BACKGROUND: Respiratory therapists (RTs) should communicate with patients in a way that leads to patients understanding their discharge plans and medical device instructions. The teach-back method is a patient-centered, health-literate technique that allows health care professionals to confirm patient understanding. The purpose of this mixed-methods pilot study was to measure the use of teach-back by first-year undergraduate RT students in a simulation-center experience after a 1-h teach-back skills training. METHODS: First-year RT students' health literacy knowledge and belief in communication skills were measured using a pre- and post- survey about their knowledge and beliefs. A 1-h health literacy and teach-back skills training lecture (ie, intervention) was delivered after the pre-testing. RT students were then assessed for teach-back use during a regularly scheduled simulation center experience. Their experiences were recorded in a semistructured interview immediately after the simulation-center experience. RESULTS: 14 of 20 RT students used teach-back in the simulation center. Knowledge scores increased from 8.278 to 8.944 postintervention, and the median scores for belief increased from 111 to 117 postintervention. There was a statistically significant postintervention increase in knowledge scores ($P < .001$) and in communication belief scores ($P = .038$). Thematic content analysis revealed 2 primary themes for teach-back use: to confirm patient understanding and to confirm proper use of medical devices. Teach-back was not used due to the discharge scenario used in the simulation center, due to the student forgetting and/or being nervous, due to how engaged the patient was, or due to individual communication style. CONCLUSIONS: Results from our pilot study indicate that RT students may benefit from a 1-h health literacy and teach-back skills training. Furthermore, we identified reasons why the teach-back method was not used and determined what communication training students perceived would be helpful. Our findings can be used to help improve and implement communication skills training in the RT curriculum. *Key words: respiratory therapists; health literacy; teach-back; health communication; educational activities; communication training.* [Respir Care 2020;65(1):68–74. © 2020 Daedalus Enterprises]

Introduction

When patients do not understand the purpose of a medication, they are more likely to be nonadherent, which can lead to ineffective treatments, disease progression, and poor health outcomes.[1-4] Proper inhaler use among patients is low[5]; research indicates that patients who used a pressurized metered-dose inhaler did so incorrectly 86% of the

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time, and Diskus dry-powder inhalers were misused 71% of the time.[6] It is essential that patients understand how to use medication properly and understand the benefits associated with the recommended regimen.[4,5] Teaching and instruction provided by respiratory therapists (RTs) can positively impact how patients understand discharge and equipment, and how they use prescribed treatments to improve health outcomes.[7]

Interpersonal communication between health care professionals and patients is essential to improved health outcomes.[8] Communication promotes the sharing of information and helps the health care professional and patient develop a rapport and build trust.[8,9] The patient's ability to follow recommendations from a health care professional and self-manage their medical conditions is positively related to a health care professional's communication skills.[10,11] The words that a health care professional uses to explain a care plan and to instruct patients can influence both the patient's response and the quality of care. Clear and easy to understand information is the most effective.[4] If the health care professional does not communicate effectively, the patient may leave the encounter without an understanding of critical medication and discharge adherence information.[4]

Health literacy is a part of health communication that describes how patients access, understand, and use health information. Health literacy also refers to how health care providers communicate accessible, understandable, and useable information.[12-14] Low health literacy is associated with poor health outcomes.[12,15-19] Patients with low health literacy are less likely to ask questions, adhere to medication and discharge instructions, and to seek preventive care, and they are more likely to have increased hospitalization and emergency room visits.[19,20] All patients are susceptible to low health literacy depending on the context and situation. When patients find themselves in an unfamiliar medical encounter, they can experience low health literacy during that medical visit. Explaining dense and complicated medical information to patients is challenging, and there is always a chance that information is not received as intended.[18] The teach-back method is a health-literate communication technique that health care professionals can use to confirm understanding by asking patients to explain in their own words what they need to do to manage their health, regardless of their health literacy level. The teach-back method is not meant to make the patient feel like they are being tested. Rather, it is a way to start a dialogue to ensure that the patient understands what the provider has told them. The health care professional must emphasize that it is their responsibility to communicate information clearly.

RTs spend a considerable amount of time explaining and instructing patients, which means that strong communication skills are essential.[21] RT educational programs emphasize the importance of communication in the field; however, few classes in health communication are offered. Within the state of Georgia, only 3 of 14 respiratory therapy programs offer an elective class specifically focused on patient communication (http://catalog.daltonstate.edu, *accessed November 2018*; https://mga.smartcatalogiq.com, *accessed November 2018*; https://catalog.georgiasouthern.edu, *accessed November 2018*). Health care professionals receive less training in communication than in any other clinical skill-based task.[22,23] RTs need to develop communication skills that enable them to interact with patients so as to ensure that patients are clear on their medication and discharge instructions. Implementing interpersonal communication training early in RT education through classroom and simulation experiences, as well as adding more clinical hours, could help address communication skills.[21] Research has shown that use of health-literate communication techniques like the teach-back method can positively impact the use of proper inhaler techniques.[24]

The purpose of this mixed-methods pilot study was to determine whether RT students' knowledge and beliefs about health-literate communication changed after a 1-h health literacy and teach-back skills training intervention. We were also interested in the use of teach-back by first-year undergraduate RT students in simulation-center experiences, as well as understanding barriers and facilitators to teach-back use by the RT students as indicated by answers to the following research questions:

- Research Question 1: Are there differences in RT students' knowledge and beliefs about health-literate com-

QUICK LOOK

Current knowledge

Communication influences patients' understanding of their diagnosis and care plan. Respiratory therapists work closely with patients by providing instructions and education. Few health professions have education with class sessions dedicated solely to interacting with patients, and therefore health professionals receive insufficient training in this regard.

What this paper contributes to our knowledge

First-year undergraduate respiratory therapy students benefited from a 1-h health literacy and teach-back skills training intervention, showing increased knowledge and belief in communication skills. Two themes identified why students used the teach-back method: to confirm patient understanding and to confirm the proper use of medical devices.

munication before and after a 1-h health literacy and teach-back skills training intervention?

- Research Question 2: Did RT students use teach-back in the simulation center after a teach-back skills training intervention?
- Research Question 3: What do RT students perceive as barriers and facilitators to the use of teach-back in the simulation center?

Methods

Sample

We recruited first-year undergraduate RT students at a large Southeastern university during the Fall 2018 semester. Students were introduced to the study during a regularly scheduled class period; the instructor recused himself from that class period. The research team informed the students that there would be 3 parts to the study: 1) pre- and postintervention health-communication knowledge and beliefs surveys, 2) assessment of teach-back use during a regularly scheduled simulation center experience, and 3) a semistructured interview immediately after the simulation center experience. The students interacted with simulated patients in the simulation lab. Recent graduates of the respiratory therapy degree program were recruited as simulated patients. The university's institutional review board approved this study.

Measures

RT students completed a demographic survey that included age, gender, race, and native language. They also completed a knowledge and beliefs survey before and after both the training intervention and the simulation-center experience. This 23-question survey was designed specifically for this study to determine student's beliefs about using teach-back and to determine health-literacy knowledge. The knowledge and beliefs survey was created based on 2 survey instruments and the 1-h health literacy and teach-back skills training lecture that the principal investigator delivered to the RT students. A section of the Always Use teach-back Conviction and Confidence Scale[25] for nonpracticing health professionals was used to measure beliefs in teach-back skills and conviction in the importance of using teach-back. The 12 questions in this section of the survey were presented in a Likert-scale format ranging from 1 (not at all important) to 10 (very important). The average response was computed for each question.

The second survey instrument that influenced the creation of the survey used in this study was Cormier's Health Literacy Knowledge and Experience Survey.[26] Cormier's survey consists of 2 parts: 1) health literacy knowledge (ie, health literacy facts, negative outcomes associated with low health literacy, health literacy screening, written information guidelines and evaluating interventions), and 2) health literacy experiences. The full survey was not provided by Cormier; however, results from Cormier's work reinforced the decision to include questions related to students' knowledge of health literacy and general communication skills. Knowledge questions were developed based on the 1-h skills training lecture delivered by the principal investigator. The knowledge section consisted of 11 multiple-choice questions focused on general health-literacy knowledge and communication skills that were taught in a 1-h health-literacy training session. Responses were coded as correct or incorrect; an average score was computed.

The 1-h health-literacy and teach-back skills training for RT students took place during a regularly scheduled class period and was delivered by the study principal investigator. The training included lecture, video, and discussions and described how health literacy impacts health outcomes, how health care professionals can reduce adverse health outcomes by developing clear communication styles with all patients, and how to use the teach-back method to ensure patients understand their care plan. The principal investigator left time for discussion and to answer students' questions. Due to the scheduling of the simulation center, this training occurred 3–6 weeks before all RT students participated in the simulation center.

The course instructor assigned simulation center experience days for the students within the next several weeks. Simulated patients were instructed to act like patients any RT might encounter in the health field. The research team individually consented and trained all simulated patients. Training consisted of introducing the concept of health-literate communication, describing the teach-back method, and discussing how to assess whether RT students used teach-back during the simulation experience.

The RT students did not know what clinical scenario they would present and discuss with the simulated patient, nor did they know the simulated patient. Each simulated patient interacted with one student at a time. Immediately after the simulation center experience, the simulated patients indicated on a score card whether the RT student used the teach-back method and returned the score card to the research coordinator. RT students then participated in a semistructured interview to discuss barriers and facilitators to the use of teach-back in the simulation center and what additional training might be helpful to improve their communication skills.

We examined mean score differences to determine if any changes occurred between the pre- and post-knowledge responses. We also use a paired-sample t test for knowledge using a bootstrap technique. We were unable to determine an internal consistency estimate for the

Table 1. Demographic Characteristics of RT Students

Gender	
Female	13 (65)
Male	7 (35)
Age, y	
Mean ± SD	26.8 ± 5
Range	20–36
Race	
African-American	7 (35)
White	5 (25)
Asian	4 (20)
Other	3 (15)
Hispanic	1 (5)
Native Language	
English	14 (70)
Other	5 (25)
Spanish	1 (5)

$n = 20$ students. Data are presented as n (%) unless otherwise noted.

knowledge measure because some of the items had no variance; however, each question in the measure came directly from the 1-h health-literacy training session, therefore we believe it has adequate face validity. For the belief questions, the non-parametric Wilcoxon signed-rank test was used to measure the ordinal variables. The beliefs survey exhibited a Cronbach's alpha coefficient of 0.79 ($n = 21$) at pre-test and 0.67 ($n = 19$) at post-test. The post-test 0.67 reliability was calculated after removing one item (ie, How convinced are you that it is important to use teach-back? [Explain in your own words.]). Including this item lowers the reliability to 0.61. This item was the only belief item to exhibit a slightly negative correlation ($r = -0.036$), indicating that it might simply be a bad item. There is also a smaller sample size at post-test, thus the hope is that, with a larger sample size, we will see stronger internal consistency at pre- and post-test. Student interview data were analyzed using thematic content analysis in NVivo 12 (QSR International, Melbourne, Australia) to understand the reasons for using or not using the teach-back method in the simulation experience.

Results

As indicated in Table 1, 13 of the 20 RT students were female; the median age was 27 y. Students were predominantly African-American (35%) and white (25%), and 70% spoke English as their native language. Simulated patient scoring indicated that 14 of 20 RT students used the teach-back method in the simulation center.

To answer Research Question 1, we compared pre- and postsimulation responses to the knowledge and beliefs survey questions. For the knowledge questions, using a paired-sample t test, there was a statistically significant increase in knowledge scores after the health-literacy and teach-back skills training intervention ($P < .001$). The knowledge survey effect size was moderate ($d = 0.539$). Of the 18 participants who returned both the pre- and the post-simulation surveys, the intervention elicited an improvement in beliefs for 12 participants, whereas 2 participants saw no difference and 4 participants' scores did not improve. For the beliefs questions, using a Wilcoxon signed-rank test to measure these ordinal variables, there was a statistically significant median increase in postintervention scores ($P = .038$). The pre-intervention median score was 111, and the post-intervention median score was 117 (Table 2). The beliefs effect size was moderate ($r = 0.489$). The moderate effect sizes for both knowledge and beliefs indicate both statistical and clinical importance.

Table 2. Comparison of Pre- and Post-Knowledge and Pre- and Post-Belief Scores

	Pre-Knowledge	Post-Knowledge
Mean ± SD	8.278 ± 1.602	8.944 ± 1.731
Range	6–11	5–11
	Pre-Belief	Post-Belief
Median (IQR)	111.0 (104–115.5)	117.0 (108–120)
Range	88–120	98–120

$n = 20$ students in both "Pre" groups. $n = 18$ students in both "Post" groups.
IQR = interquartile range

To answer Research Question 2, simulated patients were asked to score whether students used the teach-back method in the simulation center. Results indicated that 70% of students ($n = 14$) successfully used teach-back.

To answer Research Question 3, 2 key themes arose for why teach-back was used. First, teach-back was used to ensure patient understanding. Students brought up the importance of making sure patients understood what medication they received and that patients knew how to use it on their own.

> Student: … [I] wanted to make sure they understood the reason behind it [the medication] since I'm not going to be supervising them all the time when they are doing it.
> Student: To make sure they could do it at home so they could take their medication.

Second, teach-back was used to ensure proper use of medical devices. Not only was it essential for students to make sure patients knew about their medication, but it was also crucial that patients knew how to prepare and use the equipment correctly.

> Student: [I] wanted to make sure the patient knew how to properly use the device before I gave it to

him, to make sure there weren't any mishaps, pretty much.
Student: To make sure the patient understood proper use of the equipment. Making sure the patient was using the medication equipment properly [and] know[s] what to do and what not to do.

Students had multiple responses for not using teach-back. Four key themes for why students did not use teach-back were the discharge scenario used in the simulation center, the student forgot and was nervous, the patient was not engaged, and individual communication style. Three students who did not use teach-back indicated that their discharge scenarios were not easy and they felt overwhelmed. Additionally, 4 students mentioned that they forgot; of those 4 students, two commented that they were nervous.

Student: I had a mental health patient scenario and I didn't get that far. They were really working us today. It was hard to bring up and incorporate many things because of the scenario. I was not prepared for a mental health patient.
Student: The patient was paraplegic, so I was thinking about other things. I was overwhelmed by the setting and forgot about it.

One student commented that the patient's level of engagement influenced their decision to use teach-back. Another student noted their personal communication style and communication comfort level when asked why they did not use teach-back in this scenario.

Student: She [the patient] didn't really ask anything. While I was observing her, it seemed like she was doing it right.
Student: I'm not the type of person [to use teach-back]. I want to use it, but because I don't have much communication with other people- so I didn't use it.

Further, students indicated that having hands-on experience using teach-back and practicing with individuals they were not familiar with prior to the simulation-center experience would have been helpful. Many of the students expressed that applying material learned in the classroom is difficult until having hands-on practice.

Student: I'm a hands-on learner. It will help you learn when you do it. Practice at it will help me remember. You know how they say you have to hear things 3 times, but I feel like doing it after you hear it is what helps. Hearing it is cool, writing it is okay, but [it] doesn't connect until I do [it].
Student: More simulations as far as getting used to it [interacting with patients]. Hands-on approach. [It] doesn't matter how much they teach you if you can't apply it. Need to practice.
Student: I like more hands-on [activities] like labs. I can't make a connection until actually doing it.

Discussion

Results from our pilot study indicated that a 1-h health literacy and teach-back skills training intervention increased RT students' knowledge and beliefs about health-literate communication practices. Given the small sample size ($n = 18$), moderate effects of $d = 0.539$ (knowledge) and $r = 0.489$ (beliefs) suggest that a robust effect may be present. Students' knowledge and beliefs changed based on the information they were presented with during the intervention. This change may have an impact on how students approach their patients. Students were introduced to health literacy, the negative outcomes associated with low health literacy, and health-literate communication techniques. The knowledge that students gained also helped influence a change in their communication beliefs. Research indicates that interventions that incorporate attitudes and beliefs deliver better results.[28]

Most participants (70%) used the teach-back method after the 1-h health-literacy and teach-back skills training intervention. Our results show that, with skills training, RT students can use health-literate communication techniques when working with simulated patients. RT students also demonstrated that they were able to define as well as explain the benefits of using teach-back with all patients. This informs us that students understand this communication technique and the value it brings to their patients. A review of 5 different communication interventions for allied health professionals indicates that there is evidence that skills-based communication interventions improve clinical communication performance.[28] Studies consisted of relatively small samples of health professionals and used varying intervention durations. Improved communication skills of health care professionals who participated in communication skills training also increased patient centeredness and patient satisfaction.[28] Research indicates that patient satisfaction is correlated with adherence and outcomes.[11,29] When patients are engaged in their health and work with health care professionals to meet health needs, patients are more satisfied.

Patients have varying levels of health knowledge and experience, and this impacts the way they understand medication and discharge instructions. During the 1-h intervention, students learned that any patient can have low health literacy, especially when they are dealing with a new or complex diagnosis that requires use of medication and medical equipment. RT students were taught that it is

their responsibility to deliver accurate and scientific information in a way that patients can understand and use. The current curriculum does not sufficiently develop these communication skills and may leave RT students unprepared to communicate effectively with patients. Our study shows that RT students both want and need additional education and training to enhance their communication skills with patients. Data show that implementing an interpersonal communication course can help develop much-needed communication skills.[21] Additional training not only strengthens RT students' communication skills but can also increase RTs self-reported efficiency and confidence in simulated asthma education sessions following training.[27]

Communication is essential in the health care setting. Health care professionals need to know how to effectively communicate with patients to deliver important information in a way that enables patients to comprehend the care plan and self-manage his or her condition. Developing skills needed to instruct and engage patients takes time and practice. Students should begin learning and practicing these skills early in their academic programs. We found that a 1-h skills training lecture with videos was helpful, but further hands-on instruction is needed. Incorporating a variety of teaching styles (eg, discussions, observations, and role-play) would give students exposure to and the opportunity to develop health-literate communication techniques. Adding communication training to curricula is essential to developing effective communication skills for RT students.

Limitations

Our study had several limitations. First, the study had a small sample of RT student participants (n = 18); although small samples are not unusual for pilot studies such as this, the power is rather lower (0.26). However, effect sizes for both the knowledge test (d = 0.539) and the beliefs test (r = 0.489) suggest a robust effect may be present. A second limitation is the short time between the initial 1-h health literacy and teach-back skills training and the assessment of the use of the teach-back method. Training occurred 3–6 weeks before all RT students circulated through the simulation center. In the 1-h training, students observed providers using teach-back and discussed techniques of incorporating teach-back into conversations. Students did not have time to role-play or practice using teach-back during the 1-h training.

A third limitation is that we were not able to assess whether training in the teach-back method improved the use of teach-back because the RT students only participated in the simulation-center experience after our training. Participants were first-year undergraduate students who had no previous experience in a simulation center. They were expected to interact with the simulated patients and practice many new skills, such as collecting subjective and objective data, providing an assessment, and using the teach-back method. If students did not use teach-back, it may have been because they were focused on other new skills. Isolating teach-back may be a stronger assessment of this particular skill. Fourth, we did not know if RT students had been exposed to any prior health communication training. Finally, we did not measure if a longer and more comprehensive health communication training (eg, multiple exposures to teach-back, role-playing, and discussion) would have had a greater effect on RT students than a 1-h health-literacy and teach-back skills training.

Future studies should examine a multiple-exposure comprehensive health literacy and teach-back skills training that involves role-play and hands-on practice. Preintervention data should be obtained in future research to determine if there is a change in how students use teach-back before and after the skills-training intervention. Additionally, future research should determine if there is an association between provider–patient communication and student demographic characteristics.

Conclusions

Results from our pilot study indicate that a 1-h health-literacy skills intervention increased RT students' knowledge and beliefs about health-literate communication practices. We found that 14 of the 18 students used teach-back in the simulation center to ensure patient understanding and to ensure proper use of medical devices after the literacy skills intervention. Students who did not use teach-back gave the following reasons: the discharge scenario used in the simulation center didn't fit with teach-back, the student forgot and/or was nervous, the patient was not engaged, and individual communication style. Although 70% of students utilized teach-back during the simulation experience, more training and hands-on practice interacting with simulated patients may be helpful for more students to incorporate this health-literate communication technique into their clinical practice. More communication skills training and practice may lead to better adherence among students. RTs require strong communication skills to care for patients, and therefore students should receive training that prepares them accordingly. Additional training will prepare future health care professionals to interact in a meaningful way with patients, which can lead to better health outcomes for patients.

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