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Using a Dyspnea Assessment Tool to Improve Care at the End of Life

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Dyspnea is experienced by 15% to 70% of patients at end of life. Because of cognitive changes before death, patients may be unable to self-report dyspnea, which requires nurses to accurately assess and initiate symptom management. This study compared practicing nurses' experiential practice in the assessment and management of dyspnea in patients unable to self-report to practice using of the Respiratory Distress Observation Scale (RDOS). This pre-experimental pretest/posttest study evaluated nurse outcomes following a structured educational program aimed at preparing them to use the RDOS. Nurses (n = 39) who provide end-of-life care were recruited for the study. After receiving the educational program, there was not a significant difference in the nurse's ability to assess the patient's overall level of perceived comfort and determine a differential diagnosis. There was, however, improvement in the nurse's ability to correctly determine a patient's level of dyspnea ($P = .021$) and also in their ability to select appropriate treatment options. This study demonstrates applicability of the RDOS to the end-of-life population replacing experiential practice with an evidence-based tool for the assessment and treatment of dyspnea in patients who cannot self-report.

KEY WORDS

dyspnea, education, end-of-life, RDOS

Many nurses rely on experiential practice when assessing and treating patients, which can result in care inconsistencies.[1] It is unknown whether the nurse's assessment and treatment options guided by previous experience are consistent with the use of a validated assessment and treatment tool. This study compared experiential assessment and treatment of end-of-life dyspnea in standardized patient scenarios that could not self-report before and after incorporating the Respiratory Distress Observation Scale (RDOS) into their practice. To date, no studies have been done with the end-of-life population comparing the nursing assessment and management of dyspnea using experiential practice and practice after the incorporation of the RDOS tool. The purpose of this study was to compare experiential end-of-life dyspnea assessment and management before and after nurses received a structured educational program on the RDOS focused on preassessment/postassessment skills, treatment selections, identifying degrees of dyspnea, and ease of use/satisfaction with the scale.

BACKGROUND

Nurses use inspection, palpation, and auscultation when assessing patient respirations. A thorough respiratory assessment assesses rate, depth, rhythm, pattern, and effort.[2] For many patients with end-stage lung disease or advanced cancer, changes may occur in all areas of the assessment. As death nears, it is common to see tachypnea or bradypnea, changes in respiratory depth, irregularity in breathing pattern, audible sounds accompanying inspiration and/or expiration, and increased work of breathing including the use of accessory muscles.[2]

Dyspnea at the end of life can be a symptom that is distressing to patients, family members, and care providers.[3,4] The American Thoracic Society broadly describes dyspnea as "…a term used to characterize a subjective experience of breathing discomfort that consists of qualitatively distinct sensations that vary in intensity."[5(p322)] This definition supports the concept that dyspnea is a sensation and a perception that can only be self-reported. However, because of cognitive and physiologic changes that often occur in patients in their final days of life, it is necessary for nurses to be able to accurately assess dyspnea in patients who cannot self-report.[6,7] Dyspnea at the end of life is a common occurrence, yet there are relatively few operationalized measures in place to evaluate and treat dyspnea and associated outcomes to improve quality of life at end of life.[8] Research has supported that dyspnea at the end of life is the most distressing symptom for family members and often results in complicated grief due to their feelings of guilt from perceived suffering.[3]

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Despite the increasing prevalence of palliative care and hospice programs in the past 20 years, patients and families still report distressing symptoms at the end of life.[9,10] Dyspnea occurs in up to 70% of patients in the hours and days preceding death, and biobehavioral studies have shown that dyspnea involves both physical and emotional suffering for patients.[11] Because dyspnea is defined as a self-reported symptom, it is essential that nurses possess astute assessment skills when treating patients at end of life who cannot self-report their distress. The alleviation of distress and symptom management are primary objectives of hospice nurses, and nurses can experience emotional duress when they are unable to alleviate perceived suffering.[4] Also, in addition to patient suffering, the distress associated with end-of-life dyspnea can often leave families feeling guilty and angry, which can result in an increased propensity for depression, complicated grief, and other mood disturbances.

Over the past 8 years, the RDOS has been used in various settings including intensive care areas, acute care, and palliative care.[12] There continues to be ethical debate about the vulnerability of using patients near the end of life in research. As death nears, there is an increased likelihood of intermittent periods of delirium, which can impact decision-making capacity.[13] In addition, using actual patients for end-of-life teaching purposes can be challenged by the imminence of death. For these reasons and in an effort for the author to have more control over the scenarios, professional standardized patients were used for this study.

A comprehensive review of the literature using CINAHL, PubMed, and MEDLINE and the terms *dyspnea*, *dyspnea tools*, and *Respiratory Distress Observation Scale* identified only 9 relevant studies related to the RDOS tool. The initial study designed to establish the reliability and construct validity of the tool used healthy volunteers and 2 other groups of patients who could self-report. In this study, the RDOS was used along with the Dyspnea Visual Analog Scale, but because dyspnea and respiratory distress are essentially incongruent, this may have been a less than an ideal comparison.[14] Some studies on the RDOS have used populations who could self-report and/or had known conditions that resulted in experiencing dyspnea (chronic obstructive pulmonary disease, congestive heart failure, and pneumonia). This type of selection has the potential to bias the samples and study outcomes.[11] Recently, RDOS cutoff points were published and identified.[15] A RDOS score of 3 or greater is an indication that the patient requires palliation of respiratory distress.[15,16] To date, the RDOS is the only validated tool available for the assessment of dyspnea in patients who cannot self-report. The 8-item RDOS[6] has a Cronbach's α of .64. In 2013, the RDOS tool was used in a hospice/palliative care setting as an operational variable focused on determining the relevance of applying routine oxygen at end of life.[17] While the study involved patients who were near death, the RDOS was used to measure presence and degree of respiratory distress, with the emphasis being on determining whether oxygen was beneficial when death was near.[17] Unfortunately to date, there is no established validity for use of the tool with the nonverbal end-of-life population.

This article presents a unique educational program that utilized prerecorded ethnically diverse standardized patient scenarios that depicted various degrees of dyspnea. The program was designed specifically for nurses who provide end-of-life care but were not using the RDOS to assess and manage dyspnea. Specifically, the 4 research questions for this study were as follows:

- Do nurses demonstrate differences in their assessment skills of end-of-life dyspnea in nonverbal patients following a structured training program on the use of the RDOS?
- Do nurses demonstrate differences in their treatment selections of end-of-life dyspnea in nonverbal patients following a structured training program on the use of the RDOS?
- Do nurses demonstrate differences in their ability to assess degrees of dyspnea following a structured training program on the use of the RDOS?
- Do nurses who have been trained in the use of the RDOS report ease of use and satisfaction with the tool?

Integrating validated tools into clinical practice is critical for the successful transition to evidence-based nursing care.[1,18] Nurses have long developed and sustained nursing practices based on anecdotal and experiential learning. If care providers are not using a validated tool to assess dyspnea, it is up to the perception of the provider to determine increased respiratory effort.[19] Standardization of practices and the use of quantitative tools such as the RDOS and pain scales have the potential to reduce care disparities between providers, which can result in improved patient and family comfort at the end of life.

METHODS

The RDOS was developed as a method for health care providers to assess dyspnea in patients who cannot self-report.[14] Since its inception, the RDOS tool has been modified to include an eighth assessment item, which is the presence/absence of paradoxical breathing. Paradoxical breathing is described as breathing movements in which the chest moves in on inspiration and out on expiration, which is the reverse of normal breathing.[20]

Project Design

This pre-experimental study was designed using a pretest/posttest format to determine improvement in the assessment and treatment of dyspnea after educational instruction on the use of the RDOS was provided. Scenarios

depicting 3 degrees of dyspnea severity were developed. The process variable was the educational theory and fidelity experience on the use of the RDOS tool. The dependent variables were the outcomes of improved dyspnea assessment and dyspnea treatment when the RDOS tool was applied in the simulation setting.[21] Studies have shown that the use of standardized patients in nursing education creates a level of realism that enriches health assessment competence.[22] The standardized patients utilized for this study were highly trained actors from a national center for simulation education and used role play to realistically depict patients with varying degrees of dyspnea. The study was approved by the quality improvement/institutional review board committee at an Eastern US medical system and the author's affiliated university institutional review board committee prior to the start of the study.

Participants

Nurses who provide end-of-life care were the target population to receive the educational program on the use of the RDOS tool for this study. Nurses participating in the study worked in settings where there was currently no standardized tool for dyspnea assessment in use. There were 2 settings used for this study. The first was a not-for-profit hospice agency located in the Northeast that provides hospice care both in the community and at a dedicated hospice inpatient unit. The other was a medical/surgical unit of a rural community hospital in the Western United States where the nurses provide end-of-life and "comfort measures only" care without access to any palliative care specialty services. All nurse participants received the RDOS educational program along with the questionnaires, pretest/posttest, and evaluations. Inclusion criteria were limited to registered nurses (RNs) older than 18 years who currently were employed in settings that provide end-of-life care. Exclusion criteria included any staff who were not RNs.

Tools

The simulation scenarios were developed by the author and filmed using standardized patients of multiple ethnicities at an Eastern US medical school simulation center. The dyspnea scenarios were designed to depict mild, moderate, and severe levels of dyspnea using various combinations of the 8 variables of the RDOS. All but 1 of the scenarios was recorded without sound because the RDOS is designed to be used on patients who cannot self-report. The 1 scenario that had sound demonstrated expiratory grunting, which is an audible variable. Each scenario ranged from 45 to 60 seconds in length. The completed audiovisual program was formatted for portability so that on-site training and education could occur at both study locations.

Sociodemographic Collection Tool

A researcher-developed demographic tool assessed the variables of age, years of experience as a nurse, years of experience as a hospice nurse, highest level of education, employment status, primary shift worked, specialty certification possession, previous specialty End-of-Life Nursing Education Consortium (ELNEC) training, and a self-assessed rating of clinical skill in managing end-of-life dyspnea.

Nursing Assessment and Treatment Tool

This author-developed pretest/posttest was used to assess clinical assessment and treatment decisions for dyspnea in the noncommunicative patient prior to the participants receiving formalized education on the use of the RDOS. The pretest documented the nurse's assessment of patient comfort, presence and degree of dyspnea, differential diagnoses, need for nursing intervention, and initiation of nursing interventions as appropriate. Similarly, the posttest contained these same questions in addition to the documented RDOS score.

Respiratory Distress Observation Scale Tool

Campbell's[15,16] 8-item RDOS assessment tool evaluates the variables of heart rate (beats per minute), respiratory rate (breaths per minute), restlessness, and the presence/absence of paradoxical breathing pattern, accessory muscle use, grunting at end expiration, nasal flaring, and look of fear. Each variable is assigned a numerical value of 0, 1, or 2. The individual item scores are totaled, and sums range from 0 to 16, indicating the degree of dyspnea. The total score is used to determine the severity of dyspnea. A score of 0 to 2 signifies little or no respiratory distress, 3 signifies mild distress, scores 4 to 6 indicate moderate distress, and scores greater than 7 signify severe distress. Internal consistency for the RDOS[16] across studies has a Cronbach's α range of .64 to .86. Construct, convergent, and discriminant validity with the RDOS has been determined, but there is no established validity for use of the tool with the end-of-life hospice population.[16] The RDOS is not valid on neonates, young pediatric patients, or patients with cervical spine conditions resulting in quadriplegia or bulbar amyotrophic lateral sclerosis but is applicable to other adult patients who are unable to self-report dyspnea.[16]

Respiratory Distress Observation Scale Evaluation Tool

The author developed the RDOS Evaluation Tool using a 4-point Likert scale (1 = strongly agree, 2 = agree, 3 = do not agree, 4 = strongly do not agree) to evaluate the RDOS's ease of use and clinical application to the end-of-life setting. Prior to using, the researcher-developed tools were evaluated and approved by 2 content and tool development experts.

Theoretical Model

Humphreys'[21] Learning From Simulation Conceptual Model was used as a framework for this study. Specifically, the Learning From Simulations Model uses the concepts of preparedness, activation, and reflection to provide both individual and team-oriented learning based on the simulation of real-life experiences without causing harm to actual patients. The use of simulation in nursing education can strengthen clinical skills, support continued excellence, and refine practice.[1,21]

Procedure/Intervention

After obtaining participant consent and collecting demographic data, the RDOS educational program was presented to the nurses using an audiovisual format presented at their place of employment. The nurses were asked to view the 6 videotaped simulation scenarios pre- and post-RDOS education. With the initial viewing of the nonverbal scenarios, nurses completed the pretest using only experiential knowledge. After the RDOS education was presented, the nurses rewatched the video and applied the RDOS on the posttest to obtain a numerical score that indicated the patient's degree of dyspnea. Three levels of dyspnea (mild, moderate, severe) were presented in a nonsequential order utilizing different combinations of the RDOS assessment variables. Using a simulation video allowed for consistently delivered scenarios regardless of the setting.

The video was paused after each scenario to allow all participants time to complete the required assessment and treatment information. For each scenario, the nurses were asked to determine whether the patient appeared comfortable, identify the patient's level of dyspnea, and identify their treatment plan based on experiential practice. These data were collected as preintervention data. Once completed, the educational program on the development and use of the RDOS tool and its cutoff points was presented by the nurse researcher who is a palliative nurse educator. This educational session was immediately followed by a second viewing of the 6 dyspnea scenarios with the incorporation of the RDOS score for assessment and treatment; participants scored the scenarios in the same manner for the postintervention data. The presentation ended with the completion of the single-page RDOS Evaluation Tool, which was a 2-part evaluation tool: 1 portion specific to the ease of use of the RDOS tool and the other related to the educational offering/presentation.

Data Management and Analysis

Data were collected using the questionnaires, pretests/posttests, and evaluations. Nurse participant's identification was protected using a numbering system allowing for the identification of the agency only. Each nurse participant received a packet of documents that was labeled with their self-selected identifier, which allowed the researcher to correlate pretest/posttest scores and determine completeness of the study components. A total of 39 packets were analyzed to provide the results of this study using SPSS 24.0 (IBM Corp, Armonk, New York) and Intellectus Statistics[23] version 1.01 for data analysis and interpretation.

RESULTS

Participant Demographics

Aggregate and group-specific sociodemographic data are summarized as follows. Cumulatively, the average (mean) age of participants was 46.68 (SD, 12.69) years. Ages spanned 44 years with a minimum age of 26 years and a maximum age of 70 years. In addition, 100% of the study participants were female. The mean years of nursing experience was 16.97 (SD, 14.73). Years of nursing experience spanned 49 years with a minimum of 1 year to a maximum of 50 years. The mean years of hospice/end-of-life care experience was 6.06 (SD, 6.88) years and a range of 27 years. Minimum years of hospice/end-of-life care experience was none with a maximum of 27. Nurses with their highest level of nursing education at the associate degree in nursing level comprised the majority population (43.6%) in this study, followed by 30.8% diploma RNs, 20.5% bachelor of science in nursing, and 5.1% master of science in nursing.

In addition, the participants were asked to provide information on their employment status, primary shift worked, current national specialty certifications, previous ELNEC training, and prior RDOS training and to self-rate their current level of confidence in assessing and managing end-of-life dyspnea in patients who cannot self-report. Seventy-eight percent of participants did not have a current national specialty certification; 92.3% had not received prior ELNEC education, and 84.6% had no prior education on the RDOS tool. Self-reported experiential confidence levels in assessing and managing end-of-life dyspnea results were as follows: very confident, 41%; mostly confident, 38.5%; somewhat confident, 17.9%; and not confident, 2.6%, prior to the RDOS education. Detailed participant demographic data are summarized in Table 1.

Research Questions and Item Analysis

Research question 1: Did nurses demonstrate differences in their assessment skills of end-of-life dyspnea in nonverbal patients following a structured training program on the use of the RDOS? Data to determine pre-education and posteducation assessment skills were collected from answers provided by the participants on pretest/posttest question 1 ("Does the patient appear comfortable?") and question 3 ("What is your differential diagnosis?"). Data from pretest/posttest answers to questions 1 and 3 were analyzed both individually and as cumulative data based on correct answer totals using descriptive statistics. After

TABLE 1 Sociodemographic Data

Sociodemographic Data	Values	Hospice Registered Nurses (n = 32)	Medical Registered Nurses (n = 7)	Results (n = 39)
Age	• Age in years	Mean: 49.35 SD: 11.42 Range: 41 Minimum: 29 Maximum: 70	Mean: 34.86 SD: 11.87 Range: 46 Minimum: 26 Maximum: 60	Mean: 46.68 SD: 12.69 Range: 44 Minimum: 26 Maximum: 70
Gender	• Female	32 (100%)	7 (100%)	39 (100%)
Nursing experience	• Years	Mean: 18.28 SD: 15.11 Range: 47 Minimum: 3 Maximum: 50	Mean: 11.0 SD: 12.0 Range: 34 Minimum: 1 Maximum: 35	Mean: 16.97 SD: 14.73 Range: 49 Minimum: 1 Maximum: 50
Hospice experience	• Years	Mean: 6.10 SD: 7.11 Range: 27 Minimum: 0 Maximum: 27	Mean: 6.0 SD: 6.19 Range: 16 Minimum: 0 Maximum: 16	Mean: 6.06 SD: 6.88 Range: 27 Minimum: 0 Maximum: 27
Nursing education	• Associate degree in nursing • Diploma • Bachelor of science in nursing • Master of science in nursing	12 (37.5%) 12 (37.5%) 6 (18.8%) 2 (6.3%)	5 (71.4%) 0 (0%) 2 (28.6%) 0 (0%)	17 (43.6%) 12 (30.8%) 8 (20.5%) 2 (5.1%)
Employment status	• Full-time • Part-time • Per diem	28 (87.5%) 1 (3.1%) 3 (9.4%)	6 (85.7%) 1 (14.3%) 0 (0%)	34 (87.2%) 2 (5.1%) 3 (7.7%)
Current specialty certifications	• Yes • No	7 (21.9%) 25 (78.1%)	4 (57.1%) 3 (42.9%)	11 (28.2%) 28 (71.8%)
End-of-Life Nursing Education Consortium education	• Yes • No	3 (9.4%) 29 (90.6%)	0 (0%) 7 (100%)	3 (7.7%) 36 (92.3%)
Prior Respiratory Distress Observation Scale education	• Yes • No	5 (15.6%) 27 (84.4%)	1 (14.3%) 6 (85.7%)	6 (15.4%) 33 (84.6%)
Confidence level	• Very confident • Mostly confident • Somewhat confident • Not confident	16 (50.0%) 10 (31.3%) 5 (15.6%) 1 (3.1%)	0 (0%) 4 (57.1%) 2 (28.6%) 1 (14.3%)	16 (41.0%) 14 (35.9%) 7 (17.9%) 2 (5.2%)

receiving the RDOS educational program, there was not a significant difference in the nurse's ability to assess the patient's overall level of perceived comfort and determine a differential diagnosis.

Specific to test question 1, the results of the Wilcoxon signed rank test were not significant, $V = 232.50$, $P = .052$, and for question 3, the results of the Wilcoxon signed rank test were not significant, $V = 84.00$, $P = .090$.

Research question 2: Did nurses demonstrate differences in their treatment selections of end-of-life dyspnea in nonverbal patients following a structured training program on the use of the RDOS? Data to determine pre-education and posteducation treatment skills were collected from answers provided by the participants on pretest/posttest question 5 (“What intervention is the most appropriate?”) along with their calculated RDOS score on the posttest.

There were statistically significant differences in the treatment selections on the pretest/posttest using the Wilcoxon signed rank test ($P = .016$), indicating these differences were not likely due to random variation. Table 2 shows detailed pretest/posttest results.

TABLE 2 Differences Between Preprogram/Postprogram Assessment and Management

	Pre, Mean (SD)	Post, Mean (SD)	*t*	*P*
Assessment skills	2.10 (1.05)	2.53 (1.56)	−1.90	.066
Treatment selection	2.33 (1.01)	2.89 (1.89)	−2.42	.021
Degrees of dyspnea	1.90 (1.07)	3.31 (1.32)	−5.80	<.001

Research question 3: Did nurses demonstrate a difference in their ability to assess degrees of dyspnea following a structured training program on the use of the RDOS? Data to determine dyspnea recognition were collected from answers provided by the participants on pretest/posttest question 2 ("Degree of assessed dyspnea: none, mild, moderate, severe"). In addition, the documented RDOS score provided by the nurses was analyzed to show the descriptive statistics of mean, minimum, and maximum. Specific to the improvement in the nurse's ability to correctly determine the patient's level of dyspnea, there were statistically significant differences between the pretest and posttest responses. The differences between the preprogram/postprogram are numerated in Table 3, and the individual item analysis is presented in Table 2. Participants could identify severe distress when the RDOS score was greater than 10, but there was less accuracy with mild, moderate, and severe distress when the numerical value was less than 10.

Research question 4: Did the nurses who had been trained to use the RDOS report ease of use and satisfaction in the tool? Data to determine ease of use and satisfaction with the tool were collected from 8 items on the program evaluation form. These results were analyzed to show mean percentages by group and cumulatively. The study evaluation forms were analyzed using descriptive statistics to determine the participant's views on the RDOS tool and its potential benefit to their end-of-life nursing practice. Evaluation results are summarized in the following. Specific to the tool, 97.4% of the 39 participants responded that they strongly agreed or agreed that the RDOS was easy to complete and easy to understand and that they would recommend it as an assessment tool for end-of-life dyspnea. As for the RDOS being time efficient, 89.7% of participants responded that they strongly agreed or agreed. When asked if the RDOS could improve end-of-life dyspnea management/treatment, consistency, and documentation, 89.7% of participants responded as strongly agreed or agreed; yet, only 87.2% believed that the RDOS could improve their personal dyspnea assessment skills. Evaluation responses of disagree or strongly disagree were reported only by the hospice nurse population related to the RDOS's ability to improve their dyspnea assessment skills. More than 80% of participants had no previous exposure to the RDOS, and the clear majority (97.4%) responded positively in finding the tool to be easy to complete and easy to understand and that they would recommend it as an assessment tool for end-of-life symptom management.

DISCUSSION

After receiving the RDOS educational program, there was not a significant difference in the nurse's ability to assess the patient's overall level of perceived comfort ("Does the patient appear comfortable?") and determine a differential diagnosis. However, there were statistically significant differences in the nurse's treatment selection and ability to correctly determine the patient's level of dyspnea after receiving education on the RDOS.

Assessment skills are fundamental to nursing practice and require nurses to use many of their senses, especially when they are providing care to patients who cannot self-report. As shown in this study, nurses' experiential assessment skills remained highly accurate when determining the patients' perceived level of comfort prior to receiving RDOS education. This said, and knowing there is a high prevalence of end-of-life dyspnea in patients, nurses can enhance their assessment of dyspnea severity and treatment options by using the RDOS to assign a numeric value to the patient's presenting dyspnea symptoms. Through the adaptation of standard assessment variables, nurses can reduce between care provider disparities and reduce the physical and emotional suffering attributed to end-of-life dyspnea, thus improving the patient's and family's quality of life and quality of death.[24]

Limitations

Limitations of this study include a small sample size (n = 39), and the populations of hospice nurses and medical nurses were disproportionate (n = 32 and n = 7, respectively). Despite the instructions asking participants to select their most appropriate differential diagnosis and treatment option, many selected more than 1 answer, which complicated the analysis and resulted in multiple answers being scored as incorrect even if the correct answer was one of the choices. Ideally, this pilot study should be replicated with a larger population and longitudinally to assess adaptation of the RDOS into practice and knowledge retention. An additional study also exists

TABLE 3 Individual Pretest and Posttest Item Analysis

Question/Scenario	Pretest Mean	Posttest Mean	*P*
Question 1: Does the patient appear comfortable?			
Scenario 1: moderate	0.15	0.35	.017
Scenario 2: severe	1.00	0.78	.003
Scenario 3: moderate	0.69	0.67	.771
Scenario 4: moderate	0.85	0.79	.422
Scenario 5: mild	0.26	0.31	.600
Scenario 6: severe	0.75	0.66	.184
Question 2: Degree of assessed dyspnea			
Scenario 1: moderate	0.24	0.61	.003
Scenario 2: severe	0.32	0.91	.000
Scenario 3: moderate	0.62	0.59	.812
Scenario 4: moderate	0.51	0.40	.324
Scenario 5: mild	0.21	0.29	.263
Scenario 6: severe	0.09	0.67	.000
Question 3: What is your differential diagnosis?			
Scenario 1: moderate	0.28	0.56	.001
Scenario 2: severe	0.09	0.26	.32
Scenario 3: moderate	0.72	0.69	.712
Scenario 4: moderate	0.66	0.69	.712
Scenario 5: mild	0.04	0.13	.162
Scenario 6: severe	0.38	0.44	.488
Question 4: Is symptom management required?			
Scenario 1: moderate	0.63	0.78	.134
Scenario 2: severe	1.00	1.03	.324
Scenario 3: moderate	0.91	0.94	.661
Scenario 4: moderate	0.97	1.00	.325
Scenario 5: mild	0.31	0.50	.032
Scenario 6: severe	0.88	0.97	.184
Question 5: Which intervention is most appropriate?			
Scenario 1: moderate	0.18	0.48	.002
Scenario 2: severe	0.43	0.66	.009
Scenario 3: moderate	0.16	0.56	.000

(continues)

TABLE 3 Individual Pretest and Posttest Item Analysis, Continued

Question/Scenario	Pretest Mean	Posttest Mean	*P*
Scenario 4: moderate	0.34	0.56	.051
Scenario 5: mild	0.00	0.11	.083
Scenario 6: severe	0.53	0.68	.134

in evaluating family perceptions of dyspnea management in patients whose symptoms are assessed and managed using the RDOS.

CONCLUSION

Despite how common dyspnea at the end of life is, there remain relatively few operationalized measures in place to evaluate and treat dyspnea to improve quality of life at end of life.[8] Knowing that end-of-life dyspnea is distressing to patients and their families, nurses could integrate an easy-to-use evidence-based tool into their assessment tool kit. Like pain scales, which have become a patient care standard over the past 20 years, the RDOS allows the clinician to numerically score the patient's symptoms and adjust their treatment modality accordingly. Because the RDOS is specifically designed for patients who cannot self-report, this tool has applicability in many other areas of nursing including intensive care units, emergency departments, and long-term-care settings but requires training prior to utilization.

The results of this study demonstrate that nurses who provide end-of-life care can increase their ability to identify dyspnea severity and treat dyspnea in patients who cannot self-report by integrating the RDOS into their current practice. Nurses in this study demonstrated accuracy in their subjective assessment of patient's overall level of comfort/discomfort, which was not influenced by integrating the RDOS into their assessment. However, when using the RDOS to obtain a numerical value, there was a significant increase in the nurse's ability to appropriately categorize the patient's level of dyspnea, which in turn affects treatment selections. The ease of use of the video format allows for ongoing training and future research using the same multiethnicity scenarios. This existing program could also be easily adapted to an online learning format. Using the foundations of this study, future research could examine the effectiveness of dyspnea management using the RDOS when it is integrated into an electronic health record, compare results to determine whether access to palliative care services influences the nurse's ability to assess and manage end-of-life dyspnea, and examine RDOS assessment scores with treatments to determine whether there is improved consistency in care delivered and thus the patient's overall comfort.

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