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End-of-Life Care Education for Respiratory Therapy Students

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Abstract

Introduction: Respiratory therapy students may encounter seriously ill and dying patients during their clinical rotations, but they often do not receive adequate instruction in end-of-life care. The purpose of this study was to evaluate the effectiveness of an educational intervention in improving student knowledge, comfort, and preparation in providing end-of-life care. Methods: An end-of-life education intervention was developed and administered to a convenience sample of 82 students enrolled in community college-based associate degree respiratory therapy programs. The education intervention included four 30-minute video recorded sessions that were administered asynchronously. A retrospective pre-post survey instrument was administered following the completion of the educational intervention to assess perceived effectiveness. Results: A total of 77 students completed the questionnaire. Paired samples t-tests results indicated that students perceived an increase in knowledge, comfort, and adequacy in preparation for participating in end-of-life care needs for a dying patient, t(76) = -9.047, p < .001, d = .87. Conclusion: Multiple short, online education sessions can be successfully integrated into the respiratory therapy curriculum as a practical and effective approach to providing end-of-life care education to students.

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Introduction

Respiratory therapists (RT) are healthcare professionals with specific training in caring for patients with cardiopulmonary diseases. The respiratory care scope of practice extends across the lifespan in a variety of in-patient and outpatient healthcare settings administering diagnostic and therapeutic interventions.¹ Most RTs work in acute care hospitals, with a vital role in the management of mechanical ventilatory support. Unfortunately, patients may die despite receiving mechanical ventilation and other advanced lifesustaining measures.² RTs are often involved in the care of patients at the end of life, which can include the termination of mechanical ventilation.

End-of-life care is supportive medical care associated with final stage of life and focuses on needs of the dying patient and their family.³ Providing services to patients during end-of-life care can place healthcare providers in the position of providing physical and emotional support to fragile individuals and their families.⁴ However, many healthcare providers have discovered that they were inadequately prepared for how to provide end-of-life care services during their medical training.⁵

The Commission on Accreditation for Respiratory Care (CoARC) entry to practice standards do not include specific language for required coursework in end-of-life care and terminating mechanical ventilation or withdrawal of life support.⁶ However, CoARC mandates that RT curricula be aligned with the National Board for Respiratory Care (NBRC) detailed content outline to ensure consistency with the competencies and duties performed by registered respiratory therapists, which includes assisting with performing the withdrawal of life support.^{6,7} However, it is unclear if education on the withdrawal of life support addresses issues of identifying the psychosocial and emotional needs of patients and families as well as their own management of any associated stress, anxiety, and emotional moral distress.

Brown-Saltzman et al.8 found that RTs felt ill-prepared to deal with end-of-life care issues despite more than half indicating that they had received education on death and dying, end-of-life care, or palliative care at some point in their RT program. Over one-third expressed experiencing distress related to participating in withdrawing life support from a patient. Less than one-third of the RTs were comfortable talking with patients who were near death and 29% said they preferred not to be with a dying patient. While 58% felt responsible for providing support to the family during end-of-life care, nearly 25% preferred not having the family present while providing care to a dying patient. In a more recent study, Grandhige et al.9 reported that approximately one-third of RTs participating in their study received education regarding terminal illness in their RT program. Most participants expressed a desire for more formal education and support for end-of-life care.

Regardless of whether RTs in this study received adequate education on end-of-life care, most did not feel comfortable discussing end-of-life issues with their patients or families.

Respiratory therapy students are likely to encounter end-of-life care situations during their clinical rotations,¹⁰⁻¹² and most will participate in end-of-life care, including withdrawing a patient from mechanical ventilation that results in death, during their professional careers.^{8,9,13,14} The need to include didactic and clinical education on end-of-life care is evident based on previous research suggesting that RTs experience emotional distress associated with endof-life care situations^{8,9,13} and would like to receive more education on these issues.^{8,9} The purpose of this study was to evaluate the effectiveness of an educational intervention in improving student knowledge, comfort, and preparation in providing end-of-life care.

Methods

This study used a descriptive survey research design to collect data. Prior to data collection, approval was obtained through sponsoring (#21-0347) and participating institutional review boards. The participating institutional review boards issued email notifications of approval but did not include reference numbers. This study was conducted in two phases, starting with a pilot study that included one associate degree respiratory therapy program and a subsequent study that included four associate degree respiratory therapy programs in one large community college system. Participant recruitment was conducted by contacting the program directors of each respiratory therapy program to request participation in the end-of-life educational intervention and their assistance in distributing the study invitation announcement and link to access the assessment tool.

Study Participants

Students enrolled in associate degree respiratory therapy programs in a large community college system were invited to participate in the education intervention and assessment. The initial pilot study phase was conducted in the spring of 2021 with one associate degree program that included eight first-year students. The program director was contacted to inquire about the program's current end-of-life care education and if improvement was needed. Following the completion of the pilot study, phase two study was conducted in the spring of 2022 by sending an invitation to request participation from 14 associate degree programs, with four agreeing to participate. Phase two of the study was conducted across the four associate degree programs with a total of 82 first- and second-year students.

End-of-Life Educational Sessions

The end-of-life education intervention was administered as four 30-minute sessions focused on four content areas: 1) introduction to end-of-life care, 2) impact on professional stakeholders involved with end-of-life care, 3) communication skills, and 4) example terminal extubation protocol checklist. The sessions provided a brief overview of end-of-life care, the RT's role, relevant research regarding the effects of providing end-of-life care on health care professionals, grief and discord scenarios, and guidance on ways to approach end-of-life care (Table 1). Previous research on end-of-life training programs and expressed needs reported by RTs on end-of-life care was used to guide the development of the education session content.^{9,11,12,14,15}

During the pilot study phase, the end-of-life educational intervention was administered as four 30-minute sessions delivered using an online synchronous format, with one each week over a four-week period. The program agreed to a selected time each week during a class period to administer the online synchronous education session. The online training environment was chosen due to the need to accommodate continued COVID-19 restrictions on college campuses. According to Moskaliuk et al.,16 online training environments should be considered when face-to-face learning encounters impractical circumstances. The synchronous format allowed for student interaction during and after the presentation, but presented some challenges if students were absent on the day of the presentation.

In the phase two study, programs were given the option of synchronous or asynchronous formats to provide more flexibility in incorporating the training sessions into their existing curricula. All four programs participating selected the online asynchronous format. The program director for each program was provided an unlisted YouTube link for the pre-recorded training sessions to share with students. There was no direct access to identifying information about the students participating in the education sessions.

Instrument and Data Collection

A pre- and post-session online survey was designed to evaluate the effectiveness of the end-of-life education intervention (Appendix A). The online survey instrument was administered using the Qualtrics platform. For the pilot study phase, the program director provided the presession survey link to students before the first education session and the post-session survey link following the final education session. The pre-session survey included three items with "yes or no" responses asking students to indicate if they had received any prior training on routine extubations, terminal extubations, and managing patients during end-oflife care. One item asked the students to indicate if they were exposed to information about removing life-sustaining therapies or terminal extubations in course textbooks. Knowledge, comfort, and adequacy of preparation in endof-life care needs for a dying patient were assessed using a measurement scale of four 5-point rating response format items, with scores ranging from 1 = strongly disagree to 5 = strongly agree. One open-ended item was included to ask students their perspective on the role of the respiratory therapist in end-of-life care. The post-session survey included one "check all that apply" item asking students to indicate which education sessions they attended. The same measurement scale of four 5-point rating response format items and the open-ended item from the pre-session survey were included in the post-session survey.

Sessions	Time	Description
Introduction to end-of-life care	30 minutes	A brief overview of end-of-life care and the respiratory therapists' role within it was discussed. This training session examined the terminology that is associated with end-of-life care and identification of the healthcare team that may work in end-of-life care. A review of a respiratory therapist's first terminal extubation experience that occurred recently after their graduation from a respiratory care program was discussed.
Impact on respiratory therapists involved with end-of-life care	30 minutes	Discussion of quantitative and qualitative findings from previous research on respiratory therapists' experiences and perceptions of providing end-of-life care.
Communication skills	30 minutes	Grief and discord scenarios within evidence-based literature were shared, and communication skills and strategies were discussed. A video was shown of a grieving mother's recollection of her 18-month-old child who was terminally ill after the result of a medication error and was removed off of life support. The infant's death was due to a lack of communication within the healthcare team.
Terminal extubation checklist	30 minutes	A terminal extubation checklist example was presented to demonstrate a stepwise approach to support practitioner organization during the delivery of sensitive services of care. The checklist was used for illustration purposes only. Emphasis was placed on following their future employer's directives and protocols regarding official terminal extubation expectations.

Table	1	End-of-Life	Education	Sessions	Overview
Table		LIIU-OI-LIIG	Luucation	063310113	Over view

After the pilot study phase was completed, modifications were made to the survey instrument to include additional items to assess students' perceptions of the effectiveness of the end-of-life education intervention and adjust the open-ended item. The items assessing effectiveness used a 5-point rating response format on increasing understanding and preparation in participating in endof-life care (1= strongly disagree to 5 = strongly agree), importance of course content (1 = not at all important to 5 = very important), and difficulty of content (1 = very difficult to 5 = very easy). Two items with "yes or no" responses were included to ask students if they benefited from the education sessions and if they thought other respiratory therapy students would also benefit. One open-ended item was included asking students their perspective on participating in end-of-life care.

The phase two study survey instrument was administered using a retrospective pre-post assessment in which students were asked to complete one questionnaire after completing the final education session. Program directors were provided the online link to the survey to distribute to students. The decision to change the survey instrument administration design was based on improving post-survey participation rates. In addition, a retrospective pre-post assessment has been shown to reveal greater accuracy in the perception of change in knowledge by minimizing an overestimation of the unknown.¹⁷

Data Analysis

IBM SPSS Statistics (Version 27) was used for data analysis. Data were screened for outliers, missing data, and normality. Descriptive statistics were used to present participant response frequencies and percentages. Paired *t*-tests were used to compare pre- and post-session composite mean score of participant perceptions on knowledge, comfort, and adequacy in preparation for participating in end-of-care life needs for a dying patient.¹⁸ Alpha level for test of significance was set at <.05. Thematic analysis was conducted on qualitative responses from an open-ended item gauging students' perspectives on participating in end-of-life care as an RT clinician. Cronbach's alpha was used to assess internal consistency of the rating scale items.

Results

A total of 8 first-year respiratory therapy students participated in the pre-session survey and education intervention during the pilot study phase. Four students (50%) reported receiving education on routine extubations, and three (35%) received education on terminal extubations before the end-of-life education intervention. Two students (25%) agreed that they were knowledgeable about end-oflife care services that RTs may be involved in, while three students (37.5%) felt adequately prepared to participate in end-of-life care needs of a dying patient. Following the endof-life education intervention, four students completed the post-session survey. All four participating students strongly agreed or agreed that they were knowledgeable about endof-life care services that RTs may be involved in and felt adequately prepared to participate in end-of-life care needs of a dying patient.

Student open-ended responses on their perspectives about the RT role in end-of-life care remained consistent before and after the education sessions regarding showing empathy and providing comfort to the patient and family. The importance of communication with the patient and family about the process and expectations during end-oflife care emerged from student responses following the completion of the education sessions.

In phase two of the study, 77 of 82 first- and second-year students completed the pre-post survey instrument. Of the 77 students, the majority had not received any education about performing routine extubations (57.1%), terminal extubations (75.3%), or managing patients during end-of-life care (71.4%) before the end-of-life education sessions. The majority of students strongly agreed or agreed that they felt knowledgeable about end-of-life care services, comfortable communicating with dying patients and their families, and prepared to participate in end-of-life care following the completion of the education sessions (81.9% to 97.4%) compared to their perceptions before receiving the education sessions (32% to 38%). Table 2 outlines the summary of survey responses for pre-post measures.

Items	Strongl ag	y agree/ ree	Neither a disag	igree or jree	Disagree/s disag	strongly ree
	Pre	Post	Pre	Post	Pre	Post
Knowledge of end-of-life care services	42%	98%	23%	2%	35%	0%
Comfort communicating with dying patients during end-of-life care	49%	83%	26%	14%	25%	3%
Comfort communicating with grieving family members during end-of-life care	45%	82%	32%	14%	23%	4%
Adequately prepared for how to participate in end-of-life care needs for a dving patient	42%	83%	22%	14%	36%	3%

Table 2 Student Perceptions of Knowledge, Comfort, and Preparedness Pre/Post End-of-Life Care Education Sessions (n = 77)

Paired samples *t*-tests of the pre- and post-session composite mean scores were conducted to determine the effectiveness of the end-of-life education sessions in improving perceptions on knowledge, comfort, and adequacy in preparation for participating in end-of-care life needs for a dying patient. The results indicated a statistically significant difference between pre- and post-session mean composite scores. Student post-session scores were significantly higher (M = 4.22, SD = .58) compared to pre-session scores (M = 3.33, SD = 1.09), t(76) = -9.047, p < .001, d = .87.

Most students strongly agreed or agreed that the education sessions increased their understanding (96.1%) and preparation to participate in end-of-life care (96.1%). Eighty-two percent of students perceived the content of the education sessions to be very important and that the content was at least "about right" for the level of difficulty (96.1%). All students reported that the education sessions were beneficial and that they would be helpful to other respiratory therapy students. The participation rate was 96% to 99% for each session.

Student responses to the open-ended item regarding their perception of participating in end-of-life care as a practicing RT revealed several themes. The themes were categorized as importance, being nervous about end-oflife-care, benefits of education, part of the job, and previous experience (Table 3). items measuring student perceptions of effectiveness of the education sessions was lower at .58.

Discussion

The findings show that respiratory therapy students participating in this study had limited knowledge, comfort in communication, and adequate preparedness for participating in end-of-life care situations in the clinical setting prior to receiving the education intervention sessions. Most students had not received previous education on end-of-life care, such as routine and terminal extubations or how to manage patients during end-of-life care. Our findings are consistent with previous research indicating that most respiratory therapy and other health science students have not received education on end-of-life care.^{8,9,19} In addition, less than half of RT students felt that they had received adequate education on preparing them to handle end-of-life care issues.

Limited research has produced mixed results regarding effectiveness of end-of-life educational interventions for RT students. Stokes et al.¹² found no significant differences between pre-lecture, post-lecture, and post-clinical death anxiety Collett-Lester Fear of Death and Dying Scale (CL-FODS) scores for first-year RT students following completion of a death and dying instructional module. The instructional module covered the rationale for end-

Theme	Description
Importance of End-of-Life Care	"After watching these training modules, it has piqued my interest in end-of-life care. My daughter is a hospice nurse, and I see how important her job is to her in being there for the patient and the families, even though she could go back to the hospital and make so much more money, she chooses to be the support for terminal patients and their families. I think I would also like to participate in making that time of the patient's (and family's) as stress-free and comfortable as possible."
	"I think it is very important to learn how to deal and take care of patients that are dying."
	"Being comfortable as a Respiratory Therapist in that situation can help both the patient and family through that time. It's important to be competent and professional because it's an event that the family will remember forever."
Nervous about	"Well, being a student and thinking about it makes me very uneasy. I guess I will have to cross that bridge when I get there but having these sessions in hand will help me in the long run."
	"I don't think that I will ever be truly prepared for the situation, but realize it is a part of what I have to do."
Benefits of End-of-Life Care Education	"I believe that attending the end-of-life sessions has better prepared me to help with end-of-life care. It also helped with teaching me how to talk to a grieving family, which I have not yet had to do."
End of Life Core is	"I understand that it is a part of the job and will do so as professionally and empathetically as I can."
Part of the Job	"I knew it was part of the job but had not fully realized and thought in-depth about all the implications until these training sessions."
Previous Experience in	"I have performed terminal extubations under the direct supervision of a licensed respiratory therapist. I feel confident in my abilities, especially after watching these additional training modules."
End-of-Life Care	"I believe this would be beneficial before heading to clinicals. I had to perform my first one prior to learning about end-of-life care, and I was very nervous, especially with the family in the room."

Table 3 Emergent Themes from Student Open-Ended Responses

Internal consistency was measured using Cronbach's alpha for the rating scale items. The pre- and post-session items measuring end-of-life care knowledge, comfort, and preparedness revealed an internal consistency of .79 and .93, respectively. Internal consistency for the rating scale

of-life education, U.S. mortality statistics, and common signs and symptoms leading up to death. Instructional activities included discussions on symptoms of dyspnea, stages of death and dying, patient spiritual concerns, and the RT role in providing end-of-life care. Collins and colleagues¹¹ published a more recent study using a similar method described by Stokes et al.¹² but added five post-clinical points of measure compared to the one post-clinical measure. Similar to previous findings, no statistically significant differences in death anxiety CL-FODS scores were observed with the pre- and post-lecture measurement points for first-year RT students. However, significant decreases in death anxiety CL-FODS scores were reported for time periods between post-lecture and after starting clinical rotations and a later time point during clinical rotations. Both studies noted similar challenges with small sample sizes and potential confounding factors (i.e., varying clinical experiences and exposure to end-oflife situations) that may have affected the results.^{11,12} Fino and Case¹⁰ conducted a qualitative study to examine highfidelity simulation as a training tool for end-of-life education. The findings suggested that simulation exercises may positively impact student learning experiences in preparing for patient and family interactions by allowing students to practice communicating with simulated patients and family members. The simulation helps students develop effective coping strategies.

Education on end-of-life care is essential in helping to prepare RT students for encountering these situations during clinical rotations and when they enter practice. The best time to introduce end-of-life care education is before students begin clinical rotations.^{10,12,19} It is not uncommon for RT students to encounter emergency code situations or be involved with providing end-of-life care during clinical rotations.^{10,12} Many RT students experience difficulty dealing with end-of-life care situations and need effective strategies to help minimize discomfort and negative emotional responses.¹⁹ Students in our study completed most or all of their clinical rotations during the COVID-19 pandemic, which heightened the need to prepare students for end-of-life care situations, especially involving terminal extubations from mechanical ventilation.

Students participating in this study significantly improved their knowledge about end-of-life care services, comfort in communicating with dying patients and grieving family members, and feelings being adequately prepared to participate in end-of-life care following the completion of the end-of-life care education sessions. Students were able to provide specific comments regarding their perspective on participating in end-of-life care. Some students expressed that working in end-of-life care would be considered a privilege and regarded their role with high importance during this time in a patient's life. Most students understood that participating in end-of-life care was inherently part of the job, but some may have attempted to reduce it to more of a technical aspect of the job. Gresham-Anderson et al.¹⁵ presented qualitative findings on coping strategies of RTs who worked in neonatal intensive care units. One attempt to cope was separation by using an emotionally detached approach. One participant comment categorized under that theme referred to having an attitude that "this is my job" to avoid emotional attachment. Several students shared that the thought of participating in end-of-life care made them nervous. Others expressed being nervous when performing their first terminal extubation, especially with family in the room. This viewpoint is reasonable considering that endof-life care for dying patients varies by situation. Student clinical experiences may vary widely depending on the clinical rotation, and the opportunity to encounter end-oflife care situations may also vary, leaving some students without the experience.^{11,19}

Evidence suggests that end-of-life care education in RT education is lacking, and a gap exists regarding specific education and training opportunities to prepare RT students for end-of-life care. While it may not be reasonable to expect RT education programs to prepare students for every possible end-of-life situation, adequate preparation can be achieved by increasing students' awareness of their role and equipping them with common aspects of end-oflife care.

Limitations

This study has several limitations. One limitation is the use of a convenience sample of respiratory therapy students from four associate degree programs, limiting the ability to generalize the results to all RT students, other health science student groups, and academic settings. Second, the survey instrument was developed by the researchers and lacks evidence of validity of the results. The survey instrument demonstrated good internal consistency for the pre-post rating-scale items, but internal consistency was moderate for rating-scale items measuring student perceptions of the effectiveness of the education sessions. Third, only four of 14 RT programs participated in the study. The COVID-19 pandemic likely played a significant role in the lack of participation. Students participating in the study completed most or all didactic, laboratory, and clinical rotations during the pandemic, which may have impacted student perceptions of their learning experiences overall and end-of-life care. Fourth, student prior life experiences, clinical experiences, and personal beliefs may present as confounding factors affecting student perceptions.

Conclusion

This study has shown that end-of-life care training can be accomplished in RT programs, serve as an effective tool in helping to prepare students for end-of-life care, and be practical without sacrificing the timeframe required for core content. The education sessions were purposefully limited to 30 minutes or less each to reduce the risk of student disengagement and avoid information overload. The importance of the RT role in end-of-life care is well documented; therefore, there is a need to provide end-oflife education that includes a variety of learning experiences in the classroom, laboratory, and clinical settings.

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Appendix A

Education Intervention Questionnaire

- 1. Prior to these 4 education sessions, had you received any training in your respiratory curriculum here about *performing routine extubations*? □ Yes □ No
- 2. Prior to these 4 education sessions, had you received any training in your respiratory curriculum here about specifically *performing terminal extubations*? □ Yes □ No
- 3. Prior to these 4 education sessions, had you received any training in your respiratory curriculum here about managing patients during end-of-life care?

 Yes
 No
- 4. Do you recall seeing any information about removing life-sustaining therapies or terminal extubations in the **textbooks** of your current respiratory curriculum? \Box Yes \Box No
- 5. I feel that I am knowledgeable in end-of-life care services required for the respiratory care practitioner.

	Before Training □ Strongly Agree	□ Agree	Neither Agree nor Disagree	Disagree	□ Strongly Disagree		
	<i>After</i> Training □ Strongly Agree	□ Agree	Neither Agree nor Disagree	Disagree	□ Strongly Disagree		
6.	I would be comfort	able comm	unicating with dying patients dur	ing end-of-life	care.		
	<i>Before</i> Training □ Strongly Agree	□ Agree	Neither Agree nor Disagree	Disagree	□ Strongly Disagree		
	<i>After</i> Training □ Strongly Agree	□ Agree	□ Neither Agree nor Disagree	Disagree	□ Strongly Disagree		
7.	I would be comfort	able comm	unicating with grieving family me	embers during	end-of-life care.		
	Before Training	□ Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree		
	After Training	□ Agree	□ Neither Agree nor Disagree	Disagree	□ Strongly Disagree		
8.	I feel that I am <i>ade</i> dying patient.	equately pre	<i>epared</i> for how to participate in e	nd-of-life care	needs for a		
	<i>Before</i> Training □ Strongly Agree	□ Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree		
	<i>After</i> Training □ Strongly Agree	□ Agree	□ Neither Agree nor Disagree	Disagree	□ Strongly Disagree		
9.	. The training sessions' course content increased my understanding of how to participate in end-of- life care needs for a dying patient.						

□ Strongly Agree □ Agree □ Neither Agree nor Disagree □ Disagree □ Strongly Disagree

10. The training sessions better prepared me for how to participate in end-of-life care needs for a dying patient.

□ Strongly Agree □ Agree □ Neither Agree nor Disagree □ Disagree □ Strongly Disagree

- 11. How important was this course content to you?
 □ Very important □ Somewhat important □ Neutral or not sure □ Not very important □ Not at all important
- 12. How difficult was this course content for you to understand?
 □ Very easy □ Somewhat easy □ About right □ Somewhat difficult □ Very difficult
- 13. How engaging did you find this course?
 □ Very engaging □ Somewhat engaging □ Neutral or not sure □ Mostly not engaging
 □ Not engaging at all □ Attended asynchronous sessions only
- 14. Do you think that you benefited from these training sessions? \Box Yes \Box No
- 15. Do you think that other respiratory care students could benefit from these training sessions? □ Yes □ No
- 16. What is your perspective about the potential of you having to participate in end-of-life care as a respiratory care professional?
- 17. Which training sessions were you able to attend or view? (Check all that apply)
 - □ Week 1 Introduction to End-of-Life Care
 - □ Week 2 Impact on Respiratory Therapists Involved with End-of-Life Care
 - □ Week 3 Communication Skills
 - □ Week 4 Terminal Extubation Checklist

Thank you for taking the time to share your perspective.

Simulation Use in Entry-into-Practice Respiratory Care Programs During the COVID-19 Pandemic: A Thematic Analysis

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Abstract

Background: In March 2020, entry-into-practice respiratory care programs experienced a sudden, macro-level shift in educational delivery due to clinical exclusion of students related to the COVID-19 pandemic. The Commission on Accreditation for Respiratory Care (CoARC) approved simulated learning activities as a temporary measure for students to complete clinical hours. The research team utilized a survey research approach to learn about simulation use between March 2020 and December 2021. Methods: A survey instrument adapted from a study of simulation practices prior to the COVID-19 pandemic was used to capture reported simulation changes. The research team performed inductive thematic analysis to examine four open-ended survey questions from the 147 unique responses received from entry-into-practice-respiratory care program directors. Results: Three themes were extracted from the data analysis. In the theme of simulation resources, respondents indicated they used simulation methods to teach when clinical sites were unavailable but needed more support with simulation's technical aspects. In the theme of controversy surrounding simulation, it was asserted that while simulation was a useful tool, it could not adequately replace clinical learning. In the theme of simulation evolution, an increase in the types and diversity of simulations was fostered by the pandemic to include interprofessional education. Conclusions: Most entry-into-practice respiratory care students returned to clinical sites by December 2021. Simulation filled an important educational role during the pandemic, and although programs continue to utilize simulation activities, simulation is no longer approved as a substitute for clinical hours by CoARC.

Keywords: Simulation training; high-fidelity simulation training; COVID-19; faculty; respiratory therapy; interprofessional education

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Background

The sudden shift to virtual learning during the COVID-19 pandemic disrupted educational practice and transformed the ways we teach, learn, and collaborate. Respiratory care programs were doubly impacted by this shift, as they rely on clinical placements to supplement didactic coursework. As the COVID-19 pandemic progressed, hospitals were quickly overwhelmed, and clinical placements became scarce or were suspended entirely. With minimal notice, educators were forced to pivot their lesson plans and reimagine how high-quality respiratory care education could continue through the pandemic.

Direct patient interaction and hands-on skills training are essential components to any health profession's curriculum. Entry-into-practice respiratory care programs increasingly rely on simulation-based learning to provide this training.¹ Simulation-based learning is an immersive instructional method used throughout the health professions to prepare trainees for clinical practice using targeted, real-time instruction and feedback.²

Coronavirus disease 2019 often impairs the cardiopulmonary system, which is of primary interest to respiratory care professionals.³ Early in the pandemic, students were restricted or excluded from the clinical setting to decrease risk and to preserve limited personal protective equipment (PPE) resources for frontline workers⁴. Simulated learning activities in socially distanced labs and through online platforms were approved by the Commission on Accreditation for Respiratory Care (CoARC) as a temporary measure to allow students to complete required clinical hours⁵.

During the COVID-19 pandemic, simulation provided an alternate way for programs to meet educational requirements and competencies. The aim of this inquiry was to identify changes to simulation utilization and delivery during the COVID-19 pandemic in entry-into-practice respiratory care programs through inductive thematic analysis.

Theoretical Framework

Event system theory offers a framework for how change occurs in organizations related to various events.⁶ In the case of a sudden environmental, wide-spread, high-level disaster like the COVID-19 pandemic, both organizational and individual behavior can change.⁶ Events that are novel, disruptive, critical, and originate at the macro level are more influential, have a broader impact, and are more enduring.⁷

The authors posit that the COVID-19 pandemic required a sudden, macro-level shift in routine, a high degree of change, and demanded urgent attention from educators and learners alike. The COVID-19 pandemic forced hospitals and other clinical facilities to reduce contact with infectious patients and conserve already limited PPE. This drastically reduced or eliminated options for clinical learning for health professions students.^{8,9} At the same time, academic institutions and organizations pivoted to online learning for students, regardless of field of study.^{10,11} Individual behavior changed or was mandated. Residential university housing was closed or reduced to accommodate quarantine requirements, so many students moved back to their home of origin or to an off-campus residence.¹¹ Social distancing and masking requirements complicated faceto-face learning, and advanced disinfection procedures created additional time barriers and resource considerations in classrooms and simulation centers.¹²

Some simulation-based learning was delivered to students through online platforms and utilized case studies coupled with audiovisual components. Faculty accustomed to face-to-face environments had to adopt online methods of teaching.¹³ In places where health professions students were allowed to access the simulation spaces and equipment, faculty had to determine how to meet educational requirements and competencies using scenarios while following social distancing and other infection control guidelines.¹⁴

The authors' theorized that there would be changes to simulation education and practice in respiratory care programs following the onset of the COVID-19 pandemic. Although simulation use in respiratory care programs has gained popularity, we propose that the COVID-19 pandemic neither accelerated nor dampened its use.

Methods

Study Design

The research team used a survey research approach to better understand how simulation use may have changed between March 2020 and December 2021. A Qualtrics survey instrument was adapted from the survey used in "Simulation Use in Entry-into-Practice Respiratory Care Programs".¹ The instrument was updated to capture how simulation use had changed since the COVID-19 pandemic. This research study was granted exempt approval by the University of Wyoming Institutional Review Board (Exempt protocol #20211012JW03140).

Data Collection

A Qualtrics survey link was distributed via email to 347 CoARC-accredited entry-into-practice respiratory care program directors in June 2021 and was closed at the end of December 2021. The survey was also posted to the Education Section of AARC Connect with approval from the American Association for Respiratory Care (AARC) Executive Office. The survey received 147 unique responses.

Data Analysis

Of the programs that responded to the survey, 95 offered associate degrees, 45 offered bachelor's degrees, and 13 offered master's degrees, with some offering more than one type of degree. Not all programs responded to all questions. A total of 34 programs indicated they used more simulation in their entry-into-practice programs since the COVID-19 pandemic began while an equal number indicated they used the same (n = 24) or less simulation (n = 10).

The research team was particularly interested in the responses to four open-ended questions in the survey and applied a thematic analysis approach to these four questions: "In your opinion, what aspects of clinical respiratory care education must only be learned in the clinical setting?", "Please describe those experiences when your students participate in interprofessional simulation", "Please describe the reason(s) you believe more or less simulation should be used in your entry-into-practice program", and "Describe the ways simulation use has changed in your program since the COVID-19 pandemic began". Responses to the four open-ended survey

Results

Throughout the COVID-19 pandemic simulation resources were challenged, controversy surrounding the clinical versus simulation debate continued, and simulation evolved. The research team extracted three themes from the survey data: simulation resources, controversy surrounding simulation, and simulation evolution. A compilation of themes and theme clusters developed by the research team are presented in Table 1 and discussed in detail below.

Table 1 Impact of	COVID-19 on	Simulation Use
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Emergent themes	Theme clusters	Formulated meanings
	Support personnel	Difficulty conducting and troubleshooting simulations, despite interest in using simulation; Inadequate compensation
Simulation resources	Access to clinical areas	Use of simulation increased; allows students to experience controlled scenarios
	Pandemic impact	Restricted access to clinical and classroom learning opportunities; Social distancing
Controversy surrounding	Simulation as a supplement to learning	Allows learning in a controlled setting in addition to the clinical setting
simulation	Learning in the clinical setting	Seen as a standard for learning skills
Seconaria avalution	Scenario diversity	Many educational opportunities via a wide variety of simulations
	Expanded learner groups	Encourages collaboration and diversity in learner groups

questions were independently reviewed by each of the three members of the research team.

The team performed an inductive thematic analysis on the responses. Thematic analysis is a qualitative research approach in which identified themes are strongly linked to the data.¹⁵ Thematic analysis seeks to make meaning of patterns identified within the data set.¹⁶ The research team followed the thematic analysis structure set forth by Braun and Clarke: familiarizing oneself with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report.¹⁶ Responses were independently coded and analyzed for themes about simulation use throughout the pandemic. After independent thematic analysis, the team reconvened to review and identify the final list of themes.

Validity

Theory triangulation was used as a means to establish validity of the data. Theory triangulation relies on professional perspectives from multiple disciplines to interpret a single data set.¹⁷ Individuals holding different status positions within the same discipline may be used.¹⁷ Validity is established when individuals from different disciplines and/or status positions interpret the data set in the same way.¹⁷ The data in this study was independently interpreted by three professionals with varying experiences, but who all share expertise in the use and scholarship of simulation. The team was composed of a mid-career registered respiratory therapist, early-career registered nurse, and end-career registered nurse who drew the same conclusions.

Simulation Resources Support Personnel

Participants acknowledged that while simulation could be a beneficial learning tool, not having adequate faculty to conduct training for simulation was a barrier to its utilization. Beyond acknowledgment of its value, participants mentioned they would like to use more simulation if they had dedicated faculty to do so. A sample of participants' statements to follow with discussion.

"The research supports simulation, we just don't have the dedicated faculty to run/complete simulations at this time."

"We would love to see greater incorporation of simulation as we write more scenarios and rewrite labs to include simulation options. Dedicated staff and faculty would help us better utilize the technology."

Compensation, or lack of compensation, available for simulation faculty was mentioned by many. Simulation facilities were often available to respiratory care programs, but the compensation for specialized faculty training, development, and time was inadequate to support continued use.

"We have the facilities; we just don't compensate faculty for the vast amount of time needed to coordinate effective clinical simulations at this time."

The inability of faculty to operate equipment or troubleshoot malfunctioning equipment presented an added barrier. When technical difficulties arise and simulation was interrupted, without timely troubleshooting, the educational impact of simulation may have been reduced.

"Equipment is not always functional when needed... issues seem to arise during breaks (when simulation session has already begun) ...faculty simply do not have the time or expertise to troubleshoot."

Access to Clinical Areas

Participants noted increased simulation use in their programs when access to clinical environments was limited. Unpredictable clinical environments and varied clinical experiences among students were mentioned as reasons to use simulation as a supplement to learning. Simulation provides a guaranteed opportunity for all students to experience the same scenario in a controlled, harm-free environment.

"Lack of access to clinical areas forced (us) to use more simulation until sites reopened."

"(Educators) cannot guarantee that each student will receive the same clinical experience, even given clinical rotations at the same site... (simulation) can supplement a student's clinical experience that may be less varied given low census of the clinical site or lack of decompensating patients at clinical."

Pandemic Impact

Many participants attributed increased simulation use to the COVID-19 pandemic. Due to pandemic-related restrictions at clinical sites, students lost opportunities to practice skills in the clinical setting, which forced programs to use simulation as a supplement to learning. These restrictions even resulted in some students missing out on in-person clinical opportunities entirely.

"We used (simulation) more during the pandemic due to access to the hospitals... our graduating class pretty much missed out on face-to-face clinical in the hospital..."

"Due to covid, students have been denied access to some of the patient rooms, and even hospitals. Simulation would allow students to see more experiences they may not have the chance to see at the site."

Although the COVID-19 pandemic removed students out of clinical areas and into alternative learning environments, guidelines and restrictions to prevent the spread of COVID-19 also posed a barrier to classroom and simulation-based education. Social distancing requirements made it difficult to run simulations or have multiple students in the same area due to limited room size.

"Due to the risk of the pandemic, the access to the campus is limited, as well as the use of the resources."

"We needed to use more (simulations), but social distancing also forced us to schedule accordingly."

"Due to social distancing requirements, we were unable to use the simulation space as we could not adequately (socially) distance."

Controversy Surrounding Simulation Simulation as a Supplement to Learning

Participants mentioned that simulation can be used to practice clinical skills, even if simulation fidelity does not match the clinical setting. The COVID-19 pandemic expanded our perspective of what was considered possible to teach or learn in a simulated setting.

"Simulation, even if low fidelity, can be performed for any skill with enough imagination and creativity."

"I can see bits and pieces of every task that can be learned in simulation after surviving the COVID era."

Using simulation as a prerequisite to clinical care was mentioned as a means to improve patient safety, student confidence, and skill proficiency. The ability to practice skills in a simulated environment beforehand was perceived as a contributor to these positive outcomes. Only learning skills in the clinical setting was described as a limited approach to learning, suggesting simulation is a valuable supplement. Participants mentioned that in some cases simulation should be required before patient contact.

"I believe it is important to provide simulation prior to actual experience as much as possible, so whenever it is available it should be used. Simulation improves patient safety and student confidence and proficiency of skills."

"The blanket statement "only in a clinical setting" establishes a limited approach to education. In many instances, e.g., ABG puncture, mannequin simulation should be a minimum prerequisite prior to performance on a patient."

Participants asserted that simulation allows students to practice skills in a safe, controlled environment. Learners can practice high-risk, high-skill, low-frequency situations without risk to patients. Faculty cannot guarantee each student will get the opportunity to practice specific skills in the clinical setting due to variation in patient census and acuity.

"Simulation allows our students to learn in a safe environment. They can experience high risk situations and are able to make mistakes and learn from those mistakes without the negative impact on a patient. The feedback we get from students is always ... more simulation."

"...some things are better to expose the students to in a controlled environment. In addition, you may never have a situation or clinical opportunity happen to the student in the hospital. Then you can simulate those."

Learning in the Clinical Setting

Although some participants mentioned incorporating simulation into every learning opportunity, others suggested that learning should occur only in the clinical setting.

"Majority of everything must be learned in the real clinical setting."

"I think that students should experience all aspects of clinical respiratory care in the clinical setting if at all possible."

Specific skills, such as communication and critical thinking, were described as best learned in the clinical setting because they are difficult to simulate.

"I believe that critical thinking, interprofessional interaction, diagnostics, and patient interactions are predominantly learned in the clinical setting."

Some respondents expressed that a limit to the amount of simulation used should be established while others indicated that simulation should not replace clinical hours.

"...(simulation) just enhances everything. Nothing replaces real time, real life. No more than $\frac{1}{3}$ (of clinical learning) should be simulation."

"I don't believe that simulation should replace clinical time ... I also feel there should be a cap on the (percent) of clinical hours that can be spent in (simulation) lab."

Simulation Evolution

Scenario Diversity

Participants stated using a wide variety of topics in simulation scenarios. High risk scenarios, such as resuscitation and trauma care, were mentioned as frequent experiences. Specific skills needed for respiratory care treatments, understanding diseases, or situations were also simulated. Those scenarios named by the respondents included: adult, pediatric, and neonatal resuscitation, trauma scenarios, nebulized medication delivery, mechanical ventilator set up and management, hyperinflation therapy, airway suctioning, arterial blood gas puncture, bronchoscopy, caring for and treating acute respiratory distress syndrome, pneumonia, atelectasis, COPD, asthma, heart failure, flail chest, false tract, motor vehicle accident, traumatic brain injury, drowning, intrahospital transfer, terminal wean, hemodynamic instability, and high risk deliveries.

Expanded Learner Groups

Simulation-based learning provides a unique environment for interprofessional education. Disciplines can develop interprofessional simulation scenarios that allow learners to work collaboratively towards a common goal.

"With (physical therapy) students, we simulate them moving an intubated patient in bed and sitting them up. Then, the (respiratory care) students help with the patient airway and teach what alarms to expect and what they mean. With (school of nursing), the (respiratory care) students teach the nursing students about the ventilator and have different scenarios for troubleshooting alarms. With (school of medicine), the (respiratory care) students teach them about different medication delivery devices, oxygen devices, and mechanical ventilators. With the (occupational therapy) students, we do the same type of scenarios as we do with (physical therapy)." Some programs participate in large interprofessional events with many students present for the same scenario. Many of these events were described as emergency or catastrophic events where different disciplines could practice team communication and crisis resource management.

"Fall semester, we offer a Mega-Code Interdisciplinary Experience incorporating Nursing, RT, Radiology, Social Work, Dental Hygiene, Athletic Training, Healthcare Admin, and Theatre. We have also included the Paramedic Program from our local community college as well as Campus Police in the past."

"Spring semester, we offer a (neonatal resuscitation program) interdisciplinary experience incorporating Nursing, (respiratory therapy), Radiology, Social Work and Theatre"

Limitations

This qualitative study of open-ended survey question responses was limited by the inability of the researchers to ask further questions of the respondents for clarification. It also represents only the interpretation of those who chose to respond to the survey.

Discussion

Our inquiry into how simulation utilization and delivery changed during the COVID-19 pandemic revealed not only those practices changed, but that the whole educational paradigm shifted. Despite increasing simulation use prior to March 2020, the COVID-19 pandemic changed simulation use in respiratory care programs in unexpected ways. Some faculty, staff, and students were not allowed to access inperson simulation facilities, and those that were identified resource barriers to teaching and learning. Equipment vendors were also working remotely, and when equipment malfunctioned faculty and staff had to troubleshoot with remote instruction using supplies on hand. Additionally, a training deficit in simulation facilitation and debriefing identified prior to the pandemic became more pronounced as faculty struggled to master both distance education and immersive simulation techniques.¹

Despite a lack of resources, both face-to-face and online simulation became a more important educational tool when students could not access the clinical environment. Regardless of the key role that simulation played when students were restricted from campus and clinical environments, some respondents downplayed its overall usefulness stating that clinical practice was preferable for all learning. Others report seeking to expand the breadth of topics covered and participating disciplines involved in simulation scenarios.

Most, if not all, respiratory care students returned to the clinical environment by the end of 2021. Although CoARC relaxed its stance on the use of simulation during the COVID-19 pandemic, the 2022 entry-into-practice standards still

indicate that it may not be substituted for clinical time or be used in assessing clinical competency.¹⁸ The accreditation standards indicate that simulation is a useful tool in some areas of respiratory care education, but do not allow it to be used as a percentage of clinical time, as in other health professions programs. Simulation use in entry-into-practice respiratory care programs continues to expand; however, additional research is needed if simulation will ever be considered comparable to clinical education.

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Service Learning in Respiratory Therapy: A Review of Student Perceptions

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Abstract

Background: A qualitative study of student perceptions of service learning (SL) was completed. Students provided smoking cessation education to volunteers as part of an undergraduate respiratory care course and reflected on their experience. The study aimed to identify student perceptions of SL in RT education. Methods: IRB approval was obtained from Midwestern State University. Students completed a SL project utilizing the American Lung Association's Freedom from Smoking® program during the spring semester of 2022. Student data were obtained from a written reflective essay. After reflective essays were completed, student (n=19) identifiers were anonymized, and assignments were uploaded into an online qualitative data analysis program for thematic content analysis. Results: Participating students agreed the process was meaningful and provided advanced learning opportunities. Analysis identified three dominant themes: professional skill development, health communication, and value in the learning experience. Professional skill development themes were related to smoking cessation strategies and classroom management skills. Themes associated with health communication were focused on communication in education. Value in the learning experience was linked primarily to real-world application. Conclusions: SL is a pedagogical strategy recognized for its value in experiential learning. Students identified three primary themes: professional skill development, health communication, and value in the learning experience having participated in the SL activity. Respiratory therapy education programs may consider the inclusion of service learning within the RT curriculum as a strategy to develop RT skills in a meaningful way.

Keywords: Service learning, student perceptions, smoking cessation, respiratory therapy, qualitative research, education

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Introduction

Service learning (SL) is defined as a teaching philosophy that integrates a learning experience with skilled activities that address a specific community need. However, these activities should be well structured and paired with individual reflection to meet the required learning objectives.^{1,2} These components are essential in differentiating SL from volunteerism or general community service. The development of an SL experience within the respiratory therapy (RT) curriculum requires significant adaptability and diligence in order to ensure the experience provides meaningful learning.^{1,3}

Noted benefits of SL in higher education courses include opportunities for problem-solving, development of leadership skills, professional growth, improved communication skills, empathy, and teamwork.^{3,4} Similarly, faculty of courses that have incorporated an SL activity also reported benefits in areas of community connection, professionalism, personal accomplishment, and affirmation.³

This study sought to closely examine student perceptions associated with an SL activity when incorporated into a senior-level respiratory rehabilitation and health promotion course. SL combines the educational objectives of the course with the application of skills, while also providing needed services to the local community. Service learning has been embraced within the higher education community as a pedagogical strategy that enhances learning opportunities while positively impacting community challenges. This research sought to share student insights and thoughts associated with the real-world application of respiratory care knowledge through a community smoking cessation course.

Methods

The study received approval from the Institutional Review Board at Midwestern State University in Wichita Falls, Texas (MSU Texas). Senior-level undergraduate respiratory students enrolled in the Bachelor of Science in Respiratory Care program provided a smoking-cessation course for adults as part of RESP 4422 Rehabilitation and Health Promotion during the spring semester of 2022. All smoking cessation classes were held at the university from February 2022 through April 2022.

Respiratory Therapy Course Description

In preparation for this SL activity, the respiratory students studied tobacco management and patient education strategies. Activities within the course were designed to complement and reinforce content relating to the SL activity. Topics within the course were focused on medical management of tobacco cessation, psychosocial assessment, self-management education, and pulmonary rehabilitation disease management and health promotion. Additional tobacco cessation content was derived from the American Lung Association's Freedom from Smoking[®]

program. This SL experience provided the students an opportunity to apply the course concepts while also providing a much-needed public health service within the community. The students aided in the planning of course activities, participant registration, and facilitated group discussions according to the Freedom from Smoking[®] guidelines.

Community Engagement

The Freedom from Smoking[®] classes were advertised via social media, campus newsletters, flyers, newspapers, and video content covered on all local media channels. Additionally, the American Lung Association posted the class information on its website. Upon completion of advertisement/registration efforts, a total of 10 participants registered to attend the Freedom from Smoking[®] classes. The classes met weekly for 6 weeks, which comprised a total of seven classes. Each class was approximately 90 minutes in length.

Service-Learning Reflective Essay

Upon course completion, all students were required to submit a reflective essay about their experiences from the SL project. The reflective essay included suggested prompts such as: (1) what was your biggest takeaway, (2) what, if any, skills did you learn from this assignment, and (3) did this experience add value to your learning experience? Self-reflection is recognized as a method that aids in ensuring identified outcomes or objectives. However, reflective writing should be free-flowing and analytical. Reflective writing should not tell the student what to write but rather encourage the student to form their own opinions and challenge their current knowledge, while identifying the connection between the service provided and their coursework.^{3,5,6} Therefore, this assignment was not graded based on the content provided by the student.

Results

Smoking Cessation Program

Nineteen senior-level respiratory care students provided smoking cessation instruction to community volunteers in Wichita Falls, Texas, as part of the American Lung Association's Freedom from Smoking® program and provided written reflections upon the summation of the course. A general inductive approach was utilized to analyze the information from the service learning reflective essay. The thematic analysis process achieves two important roles, first, to identify common themes concerning the project and second, to establish the importance of each theme by examining its recurrence in the data set.⁷ The qualitative data analysis software program Quirkos[™] software (www.guirkos.com) was used to assist in the coding and thematic analysis. Upon completion of the process, the thematic analysis allowed for the identification of observed patterns in themes, subthemes, and identifiable correlations between individual

student responses. Quotes were included to further illustrate the understanding of identified themes and their connections to the subthemes.

Respiratory Care Student Reflections

A total of 19 student reflective essay assignments were reviewed as part of the study. The open coding method provided for the identification of three emerging themes: (1) professional skill development, (2) health communication, and (3) value of the learning experience, with sub-analytical themes of smoking cessation strategies, classroom management skills, communication, and real-world application shown in Figure 1.

Figure 1. Thematic Map of Respiratory Perceptions of Service Learning



Theme 1: Professional Skill Development

Qualitative analysis of the student responses revealed a strong sense of professional skill development associated with the service-learning experience. Nineteen (100%) students cited at least one professional respiratory skill they believe strengthened as a result of the project. Two specific sub-themes related to professional skill development emerged from the analysis: smoking cessation strategies and classroom management skills.

Smoking Cessation Strategies

Nineteen (100%) students highlighted participation in this smoking cessation course as an opportunity to translate classroom learning into competency, with ten (53%) of those commenting specifically that they look forward to helping someone in their family or other healthcare settings in the future with this knowledge. The 5 R's and 5 A's strategy and triggers were subjects explicitly noted. Three (16%) students noted improved awareness of beneficial coping strategies in the following:

"From the sessions I attended, I was able to learn some coping strategies to help future patients of mine find their pathway to quitting smoking."

"I'm confident I gained enough knowledge to share and explain coping strategies. They say if you can't teach it where people understand it, then you don't know it well."

"I was able to learn useful coping strategies to help future patients find their pathway to quitting smoking. I can't wait to use these in the healthcare setting!"

Classroom Management Skills

Thirteen (68%) students commented on the development of classroom management skills within their reflection assignment. Six (32%) students specifically noted increased awareness of the workload and knowledge necessary to build and provide a successful smoking cessation program in the following:

"I learned how much went into the development of a smoking cessation plan."

"I believe the SL project did add value to my learning experience. I learned the ins and outs of teaching smoking cessation."

"I learned how to approach teaching or talking about the topics relating to smoking without being pushy and letting them feel heard."

Theme 2: Health Communication

The value of communication repetitively emerged as a significant learning outcome associated with the SL project. Nineteen (100%) students mentioned general communication as an essential skill in smoking cessation education. Furthermore, ten (53%) students noted the importance of developing a therapist-patient relationship through effective communication in smoking cessation education.

Communication

Ten (53%) students recognized the value of the patient-therapist relationship through communication. Communication strategies specifically improved listening skills and were highlighted as a significant component necessary to build rapport with program participants by eight (42%) student participants.

"What I liked about this assignment was being able to listen and hear other people's stories about their smoking experiences."

"I will really listen to what the patient is saying and it is important to make specific goals for individual patients because not all patients are the same."

"I was better able to understand smoking from the perspective of someone who is attempting to quit."

Theme 3: Value of the Learning Experience

Sixteen (84%) students clearly identified perceived educational value in integrating the SL program into the course. The most significant correlation of themes noted

between individual responses was identified as real-world application of a respiratory care skill.

Real World Application

Sixteen (84%) students cited that the project had provided an opportunity for them to practice skills learned in the rehabilitation and health promotion course. Skills found valuable in translation to real-world application included the transfer of knowledge (37%) and improved communication (32%) as well as empathy (16%).

"It allowed us to essentially see patients outside of a clinical setting and understand their process."

"Listening, encouraging, and advocating for patients were my biggest takeaways from the experience."

"A good RT has to be empathetic to their struggle."

"This assignment brought awareness to non-smokers (me) how hard it truly is to quit smoking. I think some non-smokers just assume that you can just quit and it not be something that is so hard."

Discussion

SL is widely accepted as an effective pedagogical strategy allowing for a clear connection between the rigors of didactic coursework and the real-world application of curricular content. King et al.³ noted that students learn best through an interaction of knowledge and experience, which is the basis of SL. This experiential learning strategy creates an educational opportunity that promotes the development of workplace skills through immersion in real-life scenarios. This study focused expressly on student perceptions of SL after assisting as facilitators of a smoking cessation course. A review of student reflections necessitated data analysis that was thematic and interpretive. As a result of this data analysis, three distinct themes were identified: professional skill development, health communication, and the value of the learning experience.

Professional Skill Development

Student reflections clearly indicated a strong perceived correlation between the development of clinical skills and participation in SL. Students unanimously agreed that hands-on use of classroom learning improved clinical competence upon completion of the smoking cessation course. The SL project provided an occasion for students to take knowledge gained within their respiratory curriculum and apply this information in situations not neatly defined or solved, thus allowing for the advanced development of problem-solving skills. Due to the small number of community volunteers participating in the course, each student had the opportunity to "think outside the box", making recommendations tailored to each individual participant. In addition to enhanced respiratory skill competency, students also expressed perceived value in learning classroom management skills in an authentic environment. This opportunity further provided mastery of

skills essential to the RT and a sense of confidence in those students participating in the study.

Health Communication

The development of excellent health communication skills was also identified as a positive outcome associated with the SL project within student reflections. However, the significance of communication went well beyond simple course instruction. Students also noted the value of communication in building patient-therapist relationships. Face-to-face conversations as well as excellent listening skills were highlighted within the reflection assignment as valuable learning opportunities identified from the SL project. Students noted that communication was valued for transparency and ultimately led to a greater degree of trust with the course participants. An open dialogue, as well as active collaboration, fueled an environment of collegiality and teamwork within the course. The value of clear and concise communication in healthcare education should not be ignored as future respiratory therapists enter the field.

Value of the Learning Experience

A majority of the students believed that the SL project provided value based on their ability to apply the skills learned from this experience in their future practice as respiratory therapists. Prior to this SL project, the students had not been provided many opportunities to use their skills outside of the clinical setting. Specifically, the students noted better communication skills, rapport building, and the recognition of empathy for the participants. In the clinical setting, students may not have the necessary time to openly communicate with their patients regarding their tobacco addiction. However, the Freedom From Smoking® course is designed to model that of a support group, encouraging the facilitators to find ways to connect with the participants to design a personal quit plan.8 Oppermann et al.9 found that respiratory students developed a greater sense of empathy when the students had time to build a rapport with the patients. This SL project provided the students with the ability to spend time developing that rapport with the participants over several weeks, unlike most clinical patient encounters.

Limitations

This study included reflective essays from one cohort of undergraduate respiratory care students enrolled at Midwestern State University with a total of 19 students participating, therefore limiting generalizations from data analysis. Community participation in the program was voluntary and limited as well. Additional limitations noted include the lack of diversity in the community participants, as all were female, ages 45-65.

Conclusions and Implications

This qualitative study focused on the overall perceptions of undergraduate senior-level respiratory care students engaged in SL as a pedagogical strategy. This project allowed students to utilize gained expertise and skill in the classroom/laboratory environment in real-world application. Experiential learning by definition is a "learn by doing" opportunity to utilize knowledge and skill in an effort to solidify competency in a specific area. In addition to the hands-on educational opportunity, the incorporation of reflection into the project allows for enhanced learning from the experience while providing a meaningful service to the community. Additionally, the rationale for this SL activity was associated with the goal of preparing respiratory therapy students to support and promote lung health. This activity aligned with the CoARC accreditation standard 4.03, in which respiratory curricular content should reflect competencies in providing patient, family, and community education, promoting cardiopulmonary wellness and disease prevention.10

A comprehensive study including future RT student cohorts from associate and baccalaureate, as well as graduate-level RT education programs, with an increased number of participants from a wider geographic area would provide a broader perspective of the value of SL. Respiratory therapy education programs across the nation should consider the inclusion of SL as an opportunity to engage and enhance the learning experience for RT students.

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Exploring Perceptions About Gaps in Clinical Preparation in New Respiratory Therapists in Singapore

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Abstract

Background: Respiratory therapists (RTs) are vital personnel within the multidisciplinary team caring for critically ill patients in the intensive care units (ICUs). Due to the lack of a formalized education program for RTs in Singapore, RT Scholars (RTSs) complete their RT training in an accredited RT program in the United States (U.S.). Since there are differences in professional roles and healthcare systems, returning RTSs experience a gap in clinical preparedness before onboarding to the clinical environment. This qualitative study examines the perceptions RTSs, and RT managers (RTMs) have regarding potential gaps between the American RT education system and the transition to the Singaporean healthcare system. Additionally, this study considers what opportunities exist for bridging the gaps in clinical preparedness of the RTSs. Methods: This mixed-methods investigation utilized qualitative survey interviews with six RTSs and three RTMs from various educational and clinical backgrounds, who are full-time staff in a tertiary hospital in Singapore. Results: The onboarding process is important in an RTS's career as it sets the standard and precedence for work ethic and expectations. Themes brought up in this study include educational and clinical exposure in the U.S., scope of practice, transferability of academic and clinical experience, differences in onboarding processes between RTS and foreign hires, and the transition to Singapore's workforce. Conclusion: A revamp of the current onboarding programs of the various hospitals and standardization of onboarding through appropriate training of preceptors would address the presumed gaps in clinical preparedness that are experienced by the RTSs.

Keywords: Singapore, respiratory therapy, scholar, onboarding program, preceptor, preceptee

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Introduction

Singapore has an established program that sponsors Respiratory Therapist Scholars (RTS) to earn a baccalaureate degree in respiratory care (RC) from universities across the United States (U.S.). After earning a four-year Bachelor of Science in Respiratory Therapy (BSRT) and successful completion of the National Board for Respiratory Care (NBRC) Registered Respiratory Therapist (RRT) licensure examination, these scholars are required to return to Singapore to complete a mandatory six-year contract with an assigned government hospital.

Though RC is a well-established profession in the U.S., it only emerged as a role in Singapore in the late 1990s. Due to the niche expertise and limited-service coverage areas, the presence of respiratory care practitioners (RCPs) in Singapore hospitals remains limited, and there appears to be a general lack of interest in the profession across the country. For these reasons, the Singapore government has justified that sending RTSs to the U.S. is a more feasible option to train RTs for utilization in-country. This model is not uncommon; seeking international education opportunities allows for broadening of the scope of practice due to the perceived higher impact on the student's educational development.¹

Vast differences between the healthcare systems in the U.S. and Singapore often add to the immense stress RTSs experience during the transition from academic to clinical environments. In addition to learning how to adapt to new roles, differences in culture, systemic processes, and communication all play a large part in the transition experience of these RTSs.^{2,3} Singaporean RTSs are expected to bridge this gap with little to no support from either their U.S. academic institutions or their Singaporeansponsored workplace. This perceived lack of support often adds stress to the first professional experiences of these novice clinicians.

There is little to no current literature which explores the gaps in the clinical preparedness of a sample of recent RTSs throughout the transition from the U.S. education and healthcare system to the Singaporean healthcare system. Additional investigation is needed to help identify whether there is a need to create a specialized program that caters to the onboarding of these foreign-trained graduates. The purpose of this mixed-methods study is to explore a sample of recent Singaporean RTSs' perceptions about the onboarding methods utilized upon employment. This study also seeks to understand what barriers exist in the transition from the academic environment to clinical practice and what issues RTSs have faced after receiving an education in a foreign country. Finally, this investigation will explore ways by which preceptors can help RTSs better adapt to the Singaporean healthcare system.

Background

Onboarding Methods of RTS

Although some literature exists wherein the educational quality and content received before entering the workforce was examined, many of these studies looked at the need to have minimum educational requirements as well as how the level of education translated to better coping for the new graduates.^{3,5-9} Many of the studies focused on the curricula students were exposed to and the total time of patient care exposure in either the clinical or simulation environments. While these may be strong factors in determining how well new healthcare providers transition from an academic program to clinical practice, none of these factors address how best to prepare new practitioners to practice in a foreign healthcare system, nor are the experiences of these graduates well documented.

Theoretical content learned in an academic program and tested for competency using a credentialing exam, like the NBRC exam, may not necessarily be the only type of knowledge that is applicable or needed in a workplace.⁵ Inherent assumptions about the management, coordination, and facilitation of patient care in U.S. RC programs are not transferable between international healthcare systems. Understanding different healthcare systems is especially important when a graduate considers work outside the U.S.

Transition Difficulties from Academic to Clinical Environment

It is not uncommon for new healthcare workers to struggle in transitioning from a student to a clinician.^{4,10,11} There is a myriad of factors that may affect these experiences; for example, difficulties in adapting to a new environment, addressing new responsibilities, and overwhelming workplace demands are just some of the reasons healthcare workers struggle in the first few years of practice.^{11,12}

Along with learning to manage a higher workload, new graduates are often expected to be equipped with "soft skills," like communication with other healthcare members, which may not have been emphasized in an academic program.² Additionally, students are often limited by their preceptors or programs during clinical experiences, with much of the workload controlled and specially selected to ensure the successful completion of clinical requirements.^{12,13} Often the patients that students are assigned to do not require intensive and complex management.² Although these models may support clinical competency, they do little to adequately prepare students for the rigors of the healthcare workplace, highlighting a mismatch in objectives between the academic and clinical environments. This is undoubtedly the case in Singapore, whereupon employment, RTs are expected to integrate seamlessly into the team, be efficient at communication, and be able to take on normally assigned unit caseloads in a very short period. This discrepancy in the overall capabilities of the new staff can quickly become

overwhelming as the staff attempt to not only manage their clinical caseload but also navigate other job requirements.

Preceptor/Preceptee Relationship

Studies have shown that precepting and preceptorships are skills that need to be developed and taught.^{10,13-15} Factors that contribute to a successful experience include the willingness to precept, ability to communicate appropriately, presence, clinical competence, and the need for preceptors to have a lighter workload to facilitate effective precepting and learning.¹²

Beyond the academic implications, the preceptor/ preceptee relationship plays a very robust role in the transition of a new healthcare worker. Preceptors generally and gradually aid the preceptee in gaining confidence in daily roles and demonstrate or guide soft skill development.^{11,13} The goal of a preceptor should be to help the preceptee transition from interdependence to independence.¹² There is a need to explore the preceptorpreceptee relationship and its desired effectiveness.

Differences in Clinical Practice between the USA and Singapore

Few studies have addressed the application of theoretical knowledge for international students to their native workforce environment. Because Singapore does not have RT educational programs, the country is dependent on the educational opportunities available in the U.S. As a result, Singaporean RTSs who return to work within their native healthcare system have a steep learning curve upon reintegration.

There are vast differences in the education and healthcare system that impact these RTSs' experiences, perceptions, and expectations outside of procedural clinical care. Minimal literature is available to support the experiences of foreign-trained RTs and their perceptions or transition back to their home healthcare system.

International education is fast becoming a norm as globalization occurs. With it comes unique experiences that are important to understand so that the student and healthcare system can be best supported. To address the limited understanding of the perceptions of RTSs who return to Singapore following the completion of their American education, a group of RTSs was selected for participation in a mixed-methods web interview.

Methodology

This study utilized a primarily qualitative survey design. Each participant was individually interviewed using both structured and semi-structured questions. Due to impacts related to COVID-19, the interview sessions were conducted via Google Doc. The interviews were conducted over three separate sessions. A unique interview questionnaire was created via Google Doc and a unique link was sent to each of the participants via email. In-person meetings between healthcare professionals of different institutions were highly discouraged by the Ministry of Health (MOH) as part of a national effort to reduce the chances of cross-infection between healthcare workers. Eighty percent of the participants requested the surveys to be conducted via Google Doc to allow for time flexibility in answering the questions as compared to having a videoconferencing interview, which would require them to commit to a specific time and timeframe for the interview.

Both RTMs and RTSs were interviewed for this study to gain a broader perspective on the perceived gaps in transitioning to clinical practice for the RTSs. The study was performed in Singapore. An Institutional Review Board approval was obtained from Boise State University. All participants were provided with the study information by email, provision of informed consent, and study protocol information.

The questions asked in the Google Doc interview were designed to address areas of educational and professional background, transferability of academic and clinical experience, and departmental onboarding processes.

Sample

RTMs were recruited if they had been RTMs in a Singapore government hospital for at least three years and had experience onboarding both RTSs and new foreign hires. RTSs were invited to participate in the study if they had less than five years of clinical experience in a Singapore government hospital, had completed their BSRT at an American university, and held the RRT credential from NBRC. A total of seven RTMs and 14 RTSs initially met this inclusion criterion.

All participants were initially approached via a secured healthcare texting application utilized in the Singapore healthcare system, TigerText. Once these participants agreed to participate in the study, their preferred email addresses were obtained, and further arrangements were made through email. A total of two RTMs and five RTSs engaged with this level of consent and completed the interview. Additionally, one RTM and one RTS consented to participate in the study but did not complete the interview.

Data Collection

Information packets containing the study details, informed consent form, Institutional Review Board approval, and the Google Doc interview link were sent to the participants via email. Each participant was given a study identification number, and all interview documents were labeled with the assigned study identification number.

Access to the unique Google Doc was limited to the respondent, co-principal investigator, and principal investigator. Responses were recorded and de-identified prior to coding and thematic analysis.

Data Analysis

The content validity of the interview questions was addressed using a survey instrument that was pilot tested. Field testing was completed by an RTM and RTS. The interview questions and answers were reviewed by the author and the pilot testers were allowed to provide feedback on the questions and their understanding of content asked. As a result, some questions were amended for clarity and content.

Data Collection

Interviews were carried out via Google Doc per the participant's request and as a result of impacts related to COVID-19 surges. Each interview session had a unique Google Doc link that was sent to the participant via email, as well as through an institutionally specific communication tool, TigerText. Each participant was assigned a participant identification number clearly stated at the beginning of the interview document. Each participant was given approximately one week to complete the interview questions. If it was not completed in the allocated time frame, the participants were sent a reminder text via TigerText for them to complete the interview document. All interviews were finalized within 21 weeks.

Thematic Analysis

Upon completion of the interviews, all interview data were collated and transcribed to a master copy for a comparison of the responses. The data were analyzed and coded and then categorized into themes based on keywords and conversational likeness. Data were reviewed by both authors separately and collectively the themes were agreed upon based on key points from the interview replies.

Results

RTS Participants

Of the six RT participants who consented to the interviews, 83% were female (Table 1). Respondents equally represented two specific BSRT programs in the U.S., and each of the respondents were RTSs prior to participation in this project. All RT respondents (n=6) spend at least 80% of their clinical hours in the acute setting, and each full-time employee is mandated to complete 168 work hours each month. Areas of coverage include intensive care units (ICUs), high dependency units (HDUs), rapid response teams, and cardiopulmonary resuscitation teams.

Table 1 Demographic Profile of RT Participants

D	Demographics			
Condor	Male	1	17%	
Gender	Female	5	83%	
Educational	University of Missouri	3	50%	
Program	The Ohio State University	3	50%	
	1 year	0	0%	
Years in	2 years	2	34%	
Respiratory	3 years	1	16%	
Care Practice	4 years	1	16%	
	5 years	2	34%	

RTM Participants

Three RTMs fit the criteria and participated in the study. Two-thirds of the RT managers received their BSRT from an accredited American university and others received their RT degree from a foreign university. Sixty-six percent of the managers commenced employment with a Singaporean government hospital after they graduated from their BSRT program. All of the managers found themselves in a leadership position within five years of employment in their various hospitals and have been precepting new hires for a minimum of five years. Demographic information for the RTM respondents can be found in Table 2.

Table 2 Demographic Profile of RT Managers

De	emographics	N	%
Condor	Male	1	33%
Gender	Female	2	66%
Educational	Bachelor	2	66%
Level	PhD	1	33%
Years in	1-4 Years	1	33%
Precepting	5-10 Years	1	33%
New Hires	More than 10 Years	1	33%
Years in	1-4 Years	1	33%
Management	5-10 Years	1	33%
Position	More than 10 Years	1	33%

Thematic Results from Survey

Six themes emerged from the interviews with the RTSs and RTMs in the reasons they felt were large contributing factors to the gaps in the clinical preparation of new RCPs in Singapore. Recapping the six themes: a) Educational and clinical exposure in the U.S., b) Scope of practice, c) Transferability of academic and clinical experience, d) Differences in onboarding processes between RTSs and foreign hires, and finally, e) Transition to Singapore's workforce.

Educational and Professional Background

One hundred percent of the RTS respondents provided feedback that they perceived their U.S.-based educational training as having sufficient exposure in clinical areas specific to all age groups and RT services to transition effectively to the Singaporean workplace.

However, this finding was not congruent with the responses recorded by the RTM group, a majority (66%) of whom felt that the difficulty in transitioning often experienced by a fresh graduate moving from a U.S. academic system to Singaporean healthcare is due to the lack of experience in the clinical setting. The RTMs felt that a lack of experience of the RTSs was likely due to the exposure to different levels of patient acuity during academic clinical rotations or internships, the reliance on preceptors to manage the patient under supervision, and the inability to translate knowledge into action during patient assessment and clinical skills.

Scope of Practice

Scope of practice is a component of healthcare that is often overlooked. In the U.S., RC programs must be accredited by the Commission on Accreditation for Respiratory Care (CoARC). CoARC sets educational standards for ensuring that material taught across programs adequately prepares students to sit for the credentialing exams required by the NBRC. Material included on the NBRC entry-to-practice exam encompasses all possible knowledge on all patient populations. as well as all possible skills an RCP should be able to perform. However, these expectations differ between facilities and definitely countries.

One RTM highlighted that:

"It is important to remember that Singaporean hires, although Singaporean, have been trained in a different country and have interned in a completely different working environment with different job scopes or different levels of autonomy compared to Singapore RTs. Even within Singapore hospitals, there are different levels of RT autonomy or job scopes."

Though an RTS may have completed the NBRC exams and successfully earned a license to practice and this is the fundamental building block in their theoretical and clinical competency, it is vital to note that earning an RRT credential does not signify the readiness for the RTS to integrate into the Singaporean clinical environment.

Transferability of Academic and Clinical Experience

Transferability of the academic and clinical experience between international healthcare systems needs to be considered, as the needs of the respective systems may be different. The RTSs and RTMs were asked questions about the benefits and barriers of each of the systems that the RTSs are exposed to. Table 3 summarizes responses from both groups related to the perceived benefits and barriers to learning at a U.S.-based academic program before working in a foreign healthcare system.

Based on the perceptions of respondents, some components of the U.S. academic environment were transferable to the Singaporean RT workplace experience.

This included the integration of creating and implementing RT-driven protocols, and the ability to perform foundational RT skills and soft skills like communication within the healthcare team.

Communication between healthcare staff and patients in Singapore is likely more complex than in the U.S., as unlike in the U.S where English is the main language of instruction, many different languages are spoken due to the multicultural society. Similarly, there are cultural standards that exist in an Asian society that may not be apparent in a westernized society.¹⁶

Requirement of RTs in The Singapore Healthcare System

Though the majority of the respondents agreed that the job scope and areas of practice of an RT in the U.S. are much wider than that in Singapore, there are different requirements for the RTs here in terms of the progress of care. In Singapore, the RT workload is mainly concentrated in the ICUs, with minimal RT coverage in the general wards. Should there be a medical crisis in the general wards, the RT is expected to attend to those emergencies in addition to a full workload assignment. The lack of a sustainable supply of RTs in Singapore has resulted in the RTs having to cover a large range of patient acuity. This often forces the RTSs to employ all their skills and knowledge to create a care plan and provide sound medical input that is highly sought after by the medical team.

RT-to-patient ratios are often much higher in Singapore; often 1:12-15 compared to the 1:4-6 ICU patients in the U.S. This is per MOH recommendation of a full-time RT. Another factor is the ability of the RTSs to handle a bigger workload, as the roles of an RT are different from roles performed as students in the U.S., from a service provider role to an assisting role. Despite these differences, the results of this investigation highlighted that ultimately, a large section of acute care skills was transferable from the U.S. system to the Singaporean system.

Differences in Onboarding Processes Between RTSs and Foreign Hires

Despite an overwhelming consensus that there should not be a difference in the onboarding process of an RTS versus a foreign hire, it was made clear by both groups of respondents that there do exist differences in both the onboarding process and expectations. Expectations that are placed on a foreign hire and RTSs may differ due to the different education, training, and clinical backgrounds. Though extra efforts are made to ensure that the onboarding process is equal, and both scholars and new experienced hires receive similar experiences, this may not be the case.

Scholars

Onboarding an RTS requires a different approach than that of an experienced foreign hire. RTSs often require more supervision than foreign hires due to a lack of clinical experience. Beyond the training and guidance needed for clinical management, the RTS must be trained to function and interact within the healthcare setting.

One RTS explained the difference in expectations as:

"I would expect a scholar who is a fresh graduate to be expected less of, as compared to an experienced foreign RT with at least 5 years of working experience."

This was consistent among all RTS respondents; 66% of the RTSs reported that they felt an overwhelming need to function on equal levels as a foreign hire, despite having lesser prior clinical experience than a foreign hire.

Foreign Hires

Depending on the facility that the RTSs return to, there were mixed opinions regarding the differences in onboarding. An RTS commented that although there is no difference in the content of the onboarding program, different expectations are placed on foreign hires. As these clinicians are typically hired with experience gained in a hospital overseas, there is an expectation that they know how to manage a patient on mechanical ventilation or non-invasive ventilation. Yet the reality of this is far different from perceptions, indicating that there may be a knowledge gap due to either the exposure or experiences from a previous hospital.

Transition to Singapore's Workforce Job Requirements

Aside from the basic job requirement of possessing a BSRT for all RT applicants and a minimum of at least 3 years of ICU experience for foreign hires, there are other job criteria required for a new hire to transition to the Singaporean workforce successfully. The requirement for a new hire to be able to adapt quickly and understand a new healthcare system is not special to RTSs only, but highly applicable to new foreign hires across the board.

Another job requirement is the language proficiency of the staff. Singapore's RT system depends highly on foreign hires to make up the RT numbers. With the bulk of new RTs coming from either Taiwan or the Philippines, an RTM raised the concern that these foreign individuals:

"... are very quick to fall back to their mother tongue for conversations."

Foreign-hired RTs do not necessarily graduate from a system where English is their language of instruction, leading to some difficulty during communication at work.

Even though MOH requires foreign applicants to pass an English standard test, this does not equate to the new hire being apt in conversational English, especially in the context of healthcare. Aside from clinical competency, English proficiency is a skill that is focused on as it provides the framework for successful communication and undergirds the teamwork that occurs at the bedside.

Cultural Differences

RTSs have been trained in the U.S. and have enjoyed the luxury of experiencing a healthcare system where hierarchies are not strictly adhered to. This leads to a strong emphasis on interprofessional collaboration where there is cultivation of respect and appreciation of the interprofessional team's capabilities. The flattened hierarchical structure is one factor that is familiar to the RTSs, but not the foreign hires. Another RTM discussed the social expectation of new hires, whether RTSs or foreign hires. A mismatch in expectations challenges the core concepts of work in Singapore and RTs are often disappointed by the Singaporean experience, where the RT may not have as much autonomy as compared to their previous country of training or employment.

The cultural aspect also affects RTSs but in a slightly different way. The expectation that RTS will be able to practice RC similar to that in the U.S. have contributed to a negative culture wherein RTSs return to Singapore and their expectations are not met. This mismatch in expectations, if left unaddressed, may contribute to detachment and ultimately, attrition.

Preparation Inadequacy

There are no programs currently that assist the RTSs in easing into a full-time employment position. Though feedback received on this topic is that the general onboarding programs of their hospitals have been successful in assisting the RTSs in their transition from academic to the clinical environment, there is still much to improve.

Setting expectations was a major theme in this investigation, with 66% of RTSs responding that it would have been beneficial if they had been informed of the institutional expectations. Typically, onboarding programs focus on teaching and enforcing clinical competence via adherence to policies and protocols, but they do not usually progress beyond that point. There was a consensus from all RTSs that there was no necessity for a nationwide acculturation program or module that RTSs should complete before employment. Each hospital has its own culture and practices, however, each identified that it would be beneficial for the current onboarding programs to improve to assist in this transition instead.

Preceptor's Role in Onboarding

Preceptors hold a high level of responsibility in the successful onboarding and adaptation of a new hire. There is no preference for assigning preceptors to new hires based on educational background or nationality. A preceptor was assigned based on clinical competency and years of service in that department. With varying methods of preceptor assignment among the hospitals, this variance and inconsistency in the training of a new hire may affect the quality of training. It is important to note that there are currently no precepting courses available to RTs, which impacts the way RTSs and new foreign hires are precepted.

Confusion expressed by the RTs was often compounded by the varying methods a preceptor may utilize each day. These differences, often the result of clinical experience rather than evidence-base, can result in the use of habits that may inhibit the development of an RTS. Though the RTMs have tried to assign only one person to precept, it often evolves into a group of individuals due to the complexities of scheduling; this was especially true throughout the COVID-19 pandemic. Common feedback from two RTSs is the need for only one preceptor to guide them. Here is what one had to say:

"I think it would be best for new hires to have one person that orientates them so they can learn everything first and then start to decide what is the best protocol for them."

Another common theme throughout the interviews with the RTSs was a request for standardization in the method of precepting to ensure that the preceptor was adequately prepared to teach and guide the RTSs. Often, preceptors are tasked with precepting new hires with relatively little training. This lack of support for preceptors often leads to an inadequate experience for both parties. In reference to this, one RTS mentioned:

"I felt that my preceptor asked questions because they had to ask questions. There was no discussion beyond those questions. I sometimes felt like the discussion was left hanging as there was no follow-up."

Discussion

There are very few studies that explore the gap in clinical preparedness of RT students who seek educational opportunities in the U.S. and subsequently return to a workplace abroad. This study looked at the experiences of both RTSs and RTMs.

While there are major differences in the U.S. versus the Singaporean education and clinical system, acknowledging the fact that there is room for improvement to reduce this perceived gap is important. RTSs are aware that they will be required to work in a new environment and that there will be different expectations of them once they enter the workforce, however, the reality may be difficult to adapt to. There also appears to be a consensus among RTSs that more time is spent explaining to them the differences in the systems rather than focusing on what is expected of them as an RT after transitioning home.

It is often assumed that preceptors training RTSs are skilled in guiding these new clinicians. But often they are not informed that soft skill development of preceptees is a crucial component of the educational requirements of an effective preceptor. Although preceptors cannot guarantee the outcome of a new hire in their ability to adapt and transition well into a workplace, their influence and guidance can have a positive impact on that experience if done well. The inability to transition successfully into the clinical environment can negatively impact both the team dynamic and patient experience, leading to poor outcomes, patient safety issues, or inadequate completion of work, which adds additional burden to the team.

There was a similarity between how RTSs and RTMs perceived the quality of clinical experiences of RTSs in the U.S. RTSs described curricular experiences as limited

only by time and placement constraints. There have been instances where an RTS has attended an ICU placement and was unable to fully experience caring for an ICU patient due to either a low workload in the ICU or low patient acuity, which led to minimal ICU care exposure. This, coupled with the inability of a student to manage cases independently, led to a steep learning curve upon return to Singapore, where they are expected to manage patients on their own with minimal supervision. Currently, RTSs are limited to a list of five BSRT programs that have been shortlisted by MOH. Though the selected programs are well-established programs, the clinical internship placements may not adequately prepare RTSs for transition to the Singaporean healthcare system. Being unable to explore or recommend other programs could be a factor in the inability to improve the perceived lack of clinical exposure. Sixty-six percent of the RTMs felt that the ability to select clinical intensive programs would contribute to the ability of the RTSs to transition better into the work environment. Ultimately, clinical gaps are often present for any group entering a particular workforce environment. However, steps can be taken to bridge this perceived gap that creates a steep learning curve for RTSs.

Limitations

Evaluation of educational experiences can be subjective in nature given the evaluator's bias and the educational content limiting the study's ability to identify gaps in clinical preparation accurately. The study did not reach saturation due to the inability of additional participants to complete interviews due to time and workload constraints brought about by the COVID-19 pandemic. The results of the study are limited to RTs who have received a BSRT from specific CoARC-accredited institutions located in the U.S. and who are employed in a specific country. Finally, researcher bias may have inadvertently impacted the interview and data analysis phase due to the researcher's experience in transitioning from the U.S. RC education system to the Singapore healthcare workforce. However, collaborative efforts across researchers likely mitigated the extent of any bias. Finally, the literature review on this topic only included English articles from peer-reviewed journals; pertinent information on this subject may have been excluded to retain the scope of the investigation.

Recommendations

There is a need for further research regarding the need for allied health-focused precepting programs and methods to assist new graduates in better transition into their professional practices. This is likely true of all new graduates, however, specifically those who study and practice in differing countries. Further research will contribute to the development of the current RTSs who are still based in the U.S. and are returning to Singapore in the upcoming years. Additionally, onboarding programs should be reviewed every few years and revised to meet the demands and challenges of medical education as well as the needs of the new hires. Formalized precepting courses and positions within a department should be developed to create a standardized method of onboarding. These preceptors should work closely with the RTMs to train the RTSs and new hires per the projection and expectations of the RTMs for the RT department.

Conclusion

The ability of a new hire to successfully transition from the academic world to the clinical world continues to be an issue across disciplines. New hires are often expected to be able to work independently and appropriately once their onboarding is over. However, the successful onboarding of a new hire consists of many different components. This qualitative study has provided insight into the various concerns and challenges RTSs and RTMs have experienced within the last five years to the onboarding process and the perceived gaps they experience in clinical preparedness.

Bridging this gap is an uphill battle as many new challenges have surfaced. RTMs are required to consider the current clinical situation, which may not provide experiences that are in the best interest of the RTSs. RTSs are charged with caring for high acuity care patients without appropriate support. It is an unfortunate circumstance, but attempts to support RTSs or new hires should not be pushed to the back end and be an afterthought. Bridging the gap in clinical preparedness is an ongoing process that demands the support of trained preceptors, RT management, the RT team, and finally the individual themselves.

These themes encompass the complete journey of an RTS from their educational adventure in the U.S. to returning to Singapore and transitioning to the Singapore healthcare system. No one component plays a bigger role than another in this gap of clinical preparation in new RCPs. Collectively, each theme contributed information that was enlightening about the struggles that each RTS and RTM faced in transitioning from the academic arena to the clinical environment. There is room for improvement measures designed to ease the burden and stress level of new RCPs transitioning to the Singapore healthcare system.

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Health-Science Student Perceptions of the Clinical Precepting Experience in the United States: Do We Know What They Want?

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Abstract

Background: Clinical preceptorship is a vital role in the educational development of health science students, including those seeking a career in respiratory care. When tasked with the roles and responsibilities of a clinical preceptor, it is imperative to understand student expectations regarding clinical experiences in addition to expectations centered on the clinical preceptors themselves. Clinical preceptors often question whether students appreciate candid conversations, mutual respect, a sense of humor, and approachability, along with numerous other characteristics and traits. However, limited research has been conducted to determine what exactly students value and appreciate in a clinical preceptor. This study aimed to provide answers to the following question: What characteristics and traits do health science students find the most valuable in a clinical preceptor? Methods: In this non-experimental, descriptive, exploratory study, 64 Midwestern State University undergraduate health science students were surveyed to determine what characteristics and traits students find most valuable in clinical preceptors. A self-report survey presented nursing, respiratory therapy, and radiologic science students with a series of statements about the gualities and characteristics of clinical preceptors they value the most. Results: Analysis identified prevalent qualities students valued in clinical preceptors. Attributes with highest identification percentages included the preceptor's approachability (90.6%), preceptor support (87.5%), knowledge and expertise (78.1%), clinical competence (78.1%), realistic expectations of students' performance (75%), patience (73.4%), and organization (60.9%). Conclusion: To provide health science students with successful clinical rotations, it is essential to determine the most valuable characteristics and traits of clinical preceptors. With this information, clinical preceptors may have a better understanding of what traits health science students appreciate in the preceptor role. This knowledge may also lead to improved clinical experiences for both students and preceptors.

Keywords: Preceptor, student perceptions, respiratory care, clinical, exploratory study

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Introduction

Health science clinical rotations can be described as a cornerstone in the development of clinical and professional competency in all healthcare practices. The clinical experience grants students the opportunity to advance their clinical skill set via observation and active participation.¹ The purpose of clinical rotations is to help learners attain experience by integrating their knowledge and skills at progressively higher levels of performance while being coached, mentored, and supervised by a preceptor.² Preceptor supervision allows students to go beyond simulations to actual, real-life situations. Donley et al.³ acknowledge that in the clinical setting, preceptors provide students access to patients and promote clinical skill development, role acquisition, socialization, and professional transition into the world of advanced practice.

Without preceptors, clinical rotations would become obsolete. Without clinical rotations, students would not have the experience necessary to be effective members of the medical field. As stated above, preceptors take on the responsibility of mentoring students during their clinical rotations. They serve as a guide and model to the student, so they must be chosen wisely. Blevins⁴ argues that it is the responsibility of healthcare leaders to identify and utilize individuals with effective precepting skills to groom students. In the clinical setting, preceptors assume multiple roles while managing students. They perform as coaches, facilitators, and even role models. As coaches, preceptors guide students through new experiences and difficult decision-making situations.⁵ As facilitators, preceptors create the infrastructure within a clinical site that fosters and supports student learning.⁵ As role models, preceptors demonstrate professional attitudes, values, and ethics by continually displaying these attributes over the course of the clinical experience.⁵ Clinical rotations involve a great deal of cooperation, communication, and patience between students and their preceptors. Preceptors are often tasked with formulating teaching strategies that accommodate a vast variety of students. The responsibility of precepting should only be given to individuals who want to help "bridge the gap" between coursework and clinical practice for health science students.4

To develop and foster the difficult tasks associated with being an effective clinical preceptor, which behaviors, characteristics, and attributes are necessary for the preceptor to possess? More importantly, which specific characteristics do health science students view as the most important traits of the clinical preceptor? This article explores research about the characteristics and traits of clinical preceptors valued most by current health science students during the clinical experience. Health science students were also surveyed to determine which specific qualities they find the most important regarding their clinical preceptors.

Objectives

This investigation focused on health science students' perceptions of desired characteristics of effective clinical preceptors. This research explored factors such as professional competence, relationships with students, and personal attributes during hospital-based clinical experiences to answer the following research question: What characteristics and behaviors do health science students regard as the most important traits of the clinical preceptor?

The hypotheses of the study were as follows: *Hypothesis 1:* Health science students will value a

supportive relationship with students as one of the most important characteristics of their clinical preceptors.

Hypothesis 2: Health science students will value good communication skills as one of the most important characteristics of their clinical preceptors.

Methods

Approval from the Institutional Review Board of Midwestern State University (approval no. 22021705) was obtained. Informed consent was obtained from the participants. Participation in the study was completely voluntary and an explanation of the survey being administered was provided to each student. This study used a non-experimental, descriptive exploratory design with a self-reporting survey.

The surveys were distributed and completed by participants in the Centennial Hall Health Science building on the Midwestern State University campus in Wichita Falls, Texas. The completion of the surveys took place on January 14, 2022, after a health science interdisciplinary simulation activity with 92 senior-level students from the nursing, radiologic sciences, and respiratory care programs. Sixty-four of the 92 students volunteered to participate in this study. Participants were requested to complete a short survey consisting of 35 teaching behaviors and characteristics presented on a five-point Likert scale. Responses from all 64 students were included in the study. The sample of participating students was limited to those who agreed to complete the survey for the study. No other exclusion criteria were included. No identifying information, with the exception of the individual's professional program, was recorded on the survey to guarantee each student's anonymity. Variables included the 35 behavioral characteristics presented within the survey.

The survey instrument was modified from a form that was previously validated for use with nurses by Madhavanprabhakaran et al. The modified survey (see Appendix A) was previously used by Alasmari and Gardenhire⁷ and permission was granted for the use of the survey within this study. The instrument for this research consisted of two sections. One section allowed for the collection of demographic information, including the degree of study, year or level within the participant's program, the estimated number of clinical preceptors the student had encountered, and the desired student-to-clinical instructor ratio. The second component consisted of 35 clinical preceptor behaviors or characteristics divided into three categories: professional competence, relationship with students, and personal attributes. A five-point Likert scale ranging from 5 (most important) to 1 (unimportant) was used to determine each participant's perceived level of importance for each trait.

There may be sampling bias because not all target students participated in the survey. No sample size estimate was done because only the voluntarily participating students were included. Descriptive statistics were used to analyze result frequencies within the 35 behavioral attributes of clinical preceptors.

Results

This study included a convenience sample of 64 of the 92 (69.5% participation) health science students who participated in the simulation activity, including 24 students (37.5%) from nursing, 24 students (37.5%) from radiologic sciences, and 16 students (25%) from respiratory care. The sample included 100% (n=64) senior-level undergraduate health science students. When analyzing the students' preferred ratio of students per clinical instructor, 39.1% (25 students) preferred having a 1:1 student to clinical instructor ratio. A ratio of 2:1 was recorded as the second most acceptable at 28.1% (18 students). A 3:1 ratio was considered favorable by 20.3% (13 students), while 12.5% (8 students) preferred a 4:1 ratio. No participants selected the 5:1 or the 6:1 ratio.

The characteristic of the clinical preceptor valued as the most important by the students was the preceptor's ability to encourage students to feel free to ask questions or ask for help, with a mean score of M = 4.84 and standard deviation (SD ± .51). Being supportive and helpful was found to be the next most important behavior of clinical preceptors with a mean score of M = 4.81 and standard deviation (SD ± .53). Demonstrating knowledge in the area of instruction was also determined to be of importance to students, with a mean score of M = 4.70 and standard deviation (SD ± .60). Students also valued the clinical preceptor's ability to show clinical competence, with a mean score of M = 4.67 and standard deviation (SD ± .69). Another characteristic preferred by most students was the preceptor being realistic in expectations of students' performance, with a mean score of M = 4.58 and standard deviation (SD ± .81). Additionally, a preceptor's ability to demonstrate self-control and patience was highly valued by students with a mean score of M = 4.53 and standard deviation (SD ± .87). These results can be seen in Table 1.

Figures 1, 2, and 3 represent the number of students rating each characteristic as a 5 or "most important." The results support the first hypothesis in that students do value a clinical preceptor who is supportive and helpful. However, the results refute the second hypothesis that stated students would value good communication skills as one of the most important attributes. Good communication skills, although classified as important, were only listed as most important by 47% of those surveyed, with a mean score of *M* = 4.03 and standard deviation (SD ± 1.07).

Figure 1 Professional Competence Characteristics Most Important



Figure 2 Relationship with Students Characteristics Most Important

Figure 3 Personal Attributes Most Important

Table 1 Most Important Traits and Behaviors of Clinical Preceptors Ranked by Undergraduate Health Science Students (n=64)

Item Number	Category	Characteristic	Mean	Std. Deviation
II-4	Relationship	Encourage students to feel free to ask questions	4.84	0.51
II-7	Relationship	Being supportive and helpful	4.81	0.53
I-3	Professional	Demonstrate knowledge in area of instruction	4.70	0.60
I-4	Professional	Show clinical skill competence	4.67	0.69
II-2	Relationship	Being realistic in student expectations	4.58	0.81
III-3	Personal	Ability to demonstrate self-control and patience	4.53	0.87

Likert scale of 1 (unimportant) to 5 (most important)

Discussion

The above findings suggest that students value a variety of attributes and characteristics among their clinical preceptors, however, the characteristics and attributes with the greatest response fall within the "relationship with student" section. As mentioned, this study supported the first hypothesis by determining that a majority of the students surveyed found being supportive and helpful as one of the most important characteristics of a clinical preceptor. However, the study refuted the second hypothesis by determining that the majority of students surveyed did not value good communication skills as one of the most important attributes. This strengthens the argument that clinical instructors may have an altered view of what health science students truly value in their clinical preceptors. These misconceptions of what students value in clinical preceptors may be the result of the variable needs of each generation of students. This

alone provides evidence concerning the need for up-todate preceptor training. Although health science programs integrate student needs into preceptor training, enhanced and updated content that incorporates the behaviors and characteristics most valued by current health science students may be beneficial to the clinical rotation experience for both students and preceptors.

Comparison with Previous Studies

According to O'Sullivan et al.⁵, students believe effective preceptors are able to relate to the learner as an individual, show interest in teaching, encourage students to participate in problem-solving exercises or discussions, and provide good direction and feedback. A preceptor should always maintain professionalism, as this shows the student how important it is to create a positive work environment.⁴ In 2016, a quantitative study was conducted by Otoo⁸ to determine the positive and negative effects of a studentpreceptor relationship in correlation to the student's perceived levels of competence in performing clinical skills, self-esteem, and confidence. The study suggested that the lack of a positive and cordial relationship between a student and a preceptor during the preceptorship process deprived the student of a positive clinical experience and adversely impacted the student's professional competency, selfesteem, and readiness to practice.8 According to Rambod et al.⁹, students thrive on positive affirmation and clinical preceptors have the ability to provide students with this through the development of support and encouragement. Positive gains in student success were reported in a majority of studies that had preceptors fostering knowledge and skills on teaching strategies, communication, positive reinforcement, and managing challenges in the clinical area.¹⁰ Alasmari and Gardenhire⁷ discovered in a similar study that a majority of students surveyed ranked being approachable as one of the most important traits of a preceptor. Additionally, the students surveyed rated developing a genuine relationship between the student and preceptor as a desired characteristic. In comparison to a specific skill set, one study conducted with only radiology students determined that students ranked competence and relationships equally important.¹¹

This study demonstrated a variety of clinical preceptor behaviors and characteristics most desired by health science students. However, the most effective characteristics ranked by the students surveyed were those within the "relationship with students" category. In comparison to previous studies, these findings are consistent and establish the students' desire to develop a genuine and supportive relationship with their clinical preceptors.

Limitations

This study was limited by several factors. Due to the voluntary participation of students, the surveys were not equally distributed among the various healthcare students. There may be sampling bias because not all target students participated in the survey. This limitation could be improved by distributing the surveys during an activity with equal representation for each health science program. In addition, this study used participants from only one university. Conducting the study with students from varying colleges would be beneficial and more comprehensive. Finally, the responses within this study were only from the student's perspective. It would be interesting to compare the perceptions of the most important characteristics from the students' perspectives to the preceptors' perspectives.

Conclusion

According to the research conducted within this study, the characteristics and attributes of clinical preceptors most valued by health science students are the preceptor's ability to encourage students to feel free to ask guestions or ask for help, being supportive and helpful, demonstrating knowledge in the area of instruction, ability to show clinical competence, being realistic in expectations of students' performance, demonstrating self-control and patience, and being organized and well-prepared. To develop and maintain the most optimum and effective clinical experience for health science students, it would be valuable to establish a standard of behavioral traits and characteristics of effective clinical preceptors. This comprehensive set of characteristics would provide preceptors with the understanding of what characteristics current health science students desire in addition to providing healthcare institutions with the enhanced ability to determine who among their staff would be the most effective in the preceptor role. Additionally, information and data pertaining to the desired characteristics and traits of those within the preceptor role has the ability to provide health science programs as well as healthcare institutions with more effective and valuable preceptor training.

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Appendix A

Dear Student,

This study aims to explore the effective Clinical Instructor characteristics perceived important by health care students. Your sincere response is appreciated. We assure you the confidentiality of the data. Please check ($\sqrt{}$) according to your opinion on the Effective Clinical Instructor Characteristics. There are five options to mark. 5= Most Important, 4=Important, 3= Neutral, 2=Less Important, 1=Unimportant

Part 1: Demographics Characteristics:

- 1. Number of clinical courses completed _____ course/s (as of today).
 - (a) Year/level in program: □ First year (junior) □ Second year (senior)
 - (b) Educational program:
 Nursing
 Radiologic Sciences
 Respiratory Therapy
- How many clinical instructors/preceptors have you been exposed to during your course of higher education? _____.
- 3. In your opinion regarding good ratio of Students to Clinical Instructor is:

1:1 □ 2:1 □ 3:1 □ 4:1 □ 5:1 □ 6:1 □ [sic]

Part 2: Characteristics of Effective Preceptors

No.	Characteristic of Effective Preceptors	Most Important (5)	Important (4)	Neutral uncertain (3)	Less important (2)	Unimportant (1)
I	Professional competence					
1	Facilitate student's awareness of their professional responsibility					
2	Show genuine interest in patients and their care					
3	Demonstrate knowledge in the area of instruction					
4	Show clinical skill competence					
5	Able to relate theory to practice					
6	Able to communicate knowledge and skills to students for safe practice					
7	Assist in new experiences without taking over the task from the student					
8	Available to work with students in clinical setting					
9	Demonstrate engaging style of bedside teaching					
10	Demonstrate skills, attitudes & values that are developed by students in clinical area (Role modeling).					
11	Facilitate critical thinking in clinical practice.					
12	Identifies each individual attribute of the learner					
13	Evaluate students objectively and fairly					
14	Provide individualized timely feedback					
15	Provide constructive feedback on student progress					

HEALTH-SCIENCE STUDENT PERCEPTIONS OF THE CLINICAL PRECEPTING EXPERIENCE IN THE UNITED STATES: DO WE KNOW WHAT THEY WANT?

No.	Characteristic of Effective Preceptors	Most Important (5)	Important (4)	Neutral uncertain (3)	Less important (2)	Unimportant (1)
П	Relationship with students					
1	Respect student as an individual					
2	Be realistic in expectations of students' performance					
3	Be honest and direct with students					
4	Encourage students to feel free to ask questions or ask for help					
5	Allow freedom for discussion.					
6	Allow expression of feeling.					
7	Be supportive & helpful.					
8	Be approachable.					
Ш	Personal Attributes.					
1	Demonstrates good communication skills					
2	Able to collaborate with other disciplines					
3	Demonstrate self-control & patience					
4	Demonstrates enthusiasm for teaching					
5	Demonstrates flexibility in clinical settings					
6	Exhibit sense of humor					
7	Admits limitations					
8	Be organized and well prepared					
9	Responds promptly					
10	Responds confidently					
11	Exhibits responsibility					
12	Exhibits autonomy					

Issues Related to the Bachelor of Science in Respiratory Therapy Degree in Florida: An Executive Summary

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Introduction

The respiratory therapy profession is the youngest of the allied health professions (Gaebler, 2012; Glover, 2010). What began as an on-the-job technical position has developed into a profession. Developments in biomedical engineering and healthcare require formal and continuing education of respiratory therapists (Barnes et al., 2010). Professional evolution within the field demanded updating the educational curricula to enhance the soft skills of future respiratory therapists, including critical thinking and the ability to engage in problem-based protocols (Jones-Boggs, 2011; Payan-Carreira et al., 2019). Currently, and consistent with other healthcare positions, a number of states are looking at the possibility of changing the requirement for the degree for entry into the profession from the associate degree (ASRT) to the baccalaureate degree (BSRT). Nationwide, the number of programs offering degrees in respiratory therapy or cardiopulmonary science include 340 entry-level associate degrees, 76 entry-level bachelor's degrees, 29 baccalaureate degree advancement programs, seven entry-level masters' programs, four degree advancement master's programs, and one Advanced Practice Respiratory Therapist (APRT) program (Courtesy of Dr. Tom Smalling, CoARC executive director, August 2022).

A number of states allow community colleges to award bachelor's degrees, and Florida ranks among states whose community colleges can award bachelor's degrees (Floyd; Walker, 2008). Nationwide, respiratory therapists, department directors, and healthcare consumers require a knowledgeable respiratory therapy workforce to meet current demands in patient care. A survey conducted in New York State among respiratory therapists showed that respiratory therapists want more visibility and respect in the healthcare profession and the ability to grow professionally (Smith et al., 2017). In a similar survey, Louisiana respiratory therapists added options to expand and increase the scope of practice (Danzy et al., 2022). Sixty-four percent of respiratory therapists surveyed in New York State acknowledged that the academic standard for a respiratory therapist is a bachelor's degree (Smith et al.). Seventy percent of respiratory therapists surveyed in Louisiana agreed with their New York colleagues (Danzy et al.). In Pennsylvania, 50% of 101 respiratory therapy department directors/managers surveyed stated that they preferred professionals with a bachelor's degree, and 77.3% favored hiring only registered respiratory therapists (Armaghan et al., (2020).

In summary, the unmet needs of patients with complex cardiopulmonary impairment or disease have led to an increasing need to deliver specialized care through a broadened scope of practice that demands high-level assessment, critical thinking, and decision-making skills, and competency in the delivery of care via multiple modalities. In turn, the professional entry-level training of respiratory therapists has evolved from on-the-job training and hospitalbased certificate programs, to community college-based associate degree programs, to university-level baccalaureate and master's degree educational programs.

Complex biomedical developments and higher skills requirements from healthcare team members, including critical thinking skills, have left the profession struggling to find workable solutions to advance the educational standards of the profession. Since the challenges and opportunities to advance the respiratory baccalaureate differ from state to state, it may be helpful for states to initiate open and ongoing discussions regarding options that meet the specific needs of that state.

The FL BSRT Working Group

Toward that end, in 2019, a small and informal group of RT managers and educators from throughout Florida initially met to discuss options for moving to the RRT as the entry-level credential required for practice in Florida and advancing the RT baccalaureate within the state. Unfortunately, these efforts were tabled due to logistical issues brought about by the COVID-19 pandemic. However, in 2022, with the assistance and support of the Florida Society of Respiratory Care (FSRC), a new working group consisting of bedside clinicians, RT students, RT managers, RT educators, and physicians from throughout the State of Florida was formed. This group has become known as the BSRT Florida Working Group.

The mission of the group is as follows:

- To educate Respiratory Care Practitioners (RCPs) about national and local issues affecting the baccalaureate degree in Respiratory Care.
- To seek input from all respiratory therapy communities of interest in Florida regarding issues that should be addressed in any proposal to promote the RT baccalaureate degree entry-level in Florida.
- To provide information on various models for advancing the respiratory therapy baccalaureate degree entry-level in Florida to the communities of interest via presentations and a white paper.

The BSRT Florida Working Group remains open to all interested parties and encourages all RCPs in the state to join these critical discussions. Transparency is a core value of the group, and through the support of the FSRC, recordings and minutes of all meetings, as well as all committee documents, are available to the public at https://www.fsrc.org/bsrt-florida.

Current Challenges to Advancing the BSRT in Florida

This working group identified the following challenges to advancing the respiratory therapy baccalaureate degree entry-level in Florida:

 In many cases, most of the students' clinical educational hours occur in the two years of the ASRT programs. A number of current degree advancement, or DA programs, which are designed to allow ASRT degree practitioners to complete their baccalaureate degrees, require minimal clinical hours. Requiring the BSRT as entry-level could create an unacceptable gap between the student's clinical rotations and their baccalaureate completion. Allowing such a long gap between the end of the student's clinical education and entry into the workforce may cause a decline in the student's clinical skills and make their transition to bedside from the classroom more difficult.

- AS-level RT programs rely heavily on federal Perkins programs' funding. Perkins funds are only available to AS programs. Currently, Perkins funds are not available for BSRT programs.
- To qualify to manage a blood gas lab, a baccalaureate of sciences degree with significant coursework in sciences, such as a chemistry and biology, is required by the College of American Pathologists (CAP). Facilities have trouble meeting CAP/CLIA requirements for blood gas labs due to a lack of therapists with baccalaureate degrees that contain enough science coursework. A number of current degree advancement baccalaureate programs do not include enough science credits to meet this requirement. It may be possible to meet this need by developing additional technical certificates.
- The Florida Department of Education does not currently allow an AS program to go to a BS program but will allow for adding a BS degree advancement (DA) program.
- Florida universities within the State University System (SUS) typically do not create BSRT programs because of the high enrollment required for such programs to remain economically viable. Since such schools still need to receive Perkins funding to offset program costs, maintaining financial viability in these schools can be challenging.
- Administrative support for hiring BSRTs varies from facility to facility.
- According to the AARC, 25% of RRTs nationwide currently hold a baccalaureate degree. The exact number of Florida practitioners holding a baccalaureate is still undetermined. This small percentage makes it challenging to consider a BSRT as entry-level.
- Job descriptions are often the same for AS-level RT and the BSRT, although some facilities or systems are moving to change this.
- A current shortage in RTs across the state makes it challenging to hire BSRTs only.
- The position of the State Board of Respiratory Care on the respiratory baccalaureate is not fully known at this time.

Current Advantages to Advancing the Baccalaureate in Florida

- The State College system allows community colleges to offer BS degrees. In Florida, the following institutions offer a BSRT or a BSRT-DA: Daytona State, Florida Agricultural and Mechanical University, Florida National University, Florida Southwestern State College, Nova Southeastern University, Palm Beach State College, St. Leo's University, and Valencia College. St Petersburg College has applied for an additional BSRT completion program. There are enough programs to meet future demands for BSRT and BSRT degree advancement programs within the state.
- Most respiratory care employers in the state provide tuition reimbursement to absorb the costs of degree completion of a baccalaureate degree program.
- The FSRC has issued a position statement supporting the BSRT.
- The state has well-developed networks of managers (the Florida Respiratory Leadership Network, or FRLN) and respiratory care educators (the Florida Respiratory Educator's network, or FREN) that allow for discussing proposed solutions. In addition, there is a high degree of overlap between the two networks, facilitating an open and productive dialogue.

During the BSRT Florida Working Group public meetings, diverse options for advancing the respiratory baccalaureate were debated, and the specific advantages of each proposal were discussed. The options discussed included, but were not limited to, allowing market-driven forces to drive the transition to the baccalaureate, moving directly to the BSRT as the entry-level degree for licensure in Florida, and tiered licensure, which would involve creating an additional level of licensure for those therapists with a baccalaureate degree in respiratory therapy or cardiopulmonary sciences. After considerable discussion, no specific recommendation was agreed upon at this time, however the tiered licensure option outlined below was determined to be the option most worthy of further discussion.

Tiered Licensure

Under the tiered licensure proposal, an additional level of licensure would be created for Respiratory Care Practitioners (RCPs) in Florida, allowing three levels of licensure. These three levels would include the following:

- Certified Respiratory Therapists (CRTs), as currently structured.
- **Registered Respiratory Therapists** (RRTs or ASRRTs), as currently structured.
- Bachelor of Science Registered Respiratory Therapists (BSRRT), as a new third level of licensure.

The requirements for obtaining this third level of licensure would be the successful completion of the Bachelor of Science in Cardiopulmonary Science (BSCS) degree (CIPS code 51.0908) or its equivalent and achievement of the RRT (Registered Respiratory Therapist) "high cut" score on the National Board for Respiratory Care (NBRC) Therapist Multiple Choice Exam (TMC). The NBRC is scheduled to eliminate the Clinical Simulation Exam (CSE) exam in January of 2027.

Under this proposal, no therapist would be required to move up a level to remain licensed. However, employers may require a certain level of licensure at their discretion.

Since this is a tiered option, therapists would be able to enter the field through the successful completion of an Associate of Science (AS) degree or Applied Associate of Sciences (AAS) degree in Respiratory Care from a Commission on Accreditation for Respiratory Care (CoARC) approved program, achieving the appropriate scores on the NBRC exam(s), and obtaining licensure through the Florida Department of Health. The BSRRT could then be obtained through the completion of an appropriate degree advancement program which leads to the BSCS.

Under this proposal, respiratory therapists who hold a BSRT or BSCS degree who would like to transfer into Florida from another state could apply for BSRRT licensure without obtaining RRT licensure through the Florida Department of Health.

As mentioned earlier, there are currently an adequate number of BSCS degree programs available in the state, and Daytona State College and St. Petersburg College are in the process of adding BSCS degrees.

Employers would be encouraged to incentivize the BSRRT financially and allow for a greater scope of practice for therapists with the BSRRT credential.

Advantages of Tiered Licensure

- Current RCPs with AS degrees would be able to continue to work and not be forced to obtain their baccalaureate degree.
- Associate-level RT programs could continue uninterrupted to supply the workforce.
- A supply of AS-level RT graduates would continue to be available in the state.
- AS programs could continue to receive vital Perkins funding.
- There would not be a gap between a student's clinical education and entry to clinical practice.
- Schools that currently offer the BSCS degree would be encouraged to develop short, inexpensive technical certificates to assist RTs with bachelor's degrees in other disciplines to meet the criterion for BSRRT licensure.
- Facilities could initiate "BSRRT preferred hiring" by offering higher pay scales and clinical ladders to incentivize the BSRT.

Disadvantages of Tiered Licensure

- It may prove confusing to practitioners and the public.
- This change would perpetuate a tiered system. If the state moves to the RRT as entry-level, the profession could move to a single license. Tiered licensure would force the state to maintain multiple levels of licensure.
- Therapists with master's degrees would be placed in the same group as those with BSRT or BSCS degrees.
- Advanced Technical Certificates would have to be used to accommodate those who have undergraduate degrees in other disciplines.

Summary

During the BSRT Florida Working Group public meetings, diverse options for advancing the respiratory baccalaureate were debated, and the specific advantages of each proposal were discussed. These options included, but were not limited to, allowing market driven forces to drive the transition to the baccalaureate degree entry-level, moving directly to the BSRT as the entry level degree for licensure in Florida, and tiered licensure, which would involve creating an additional level of licensure for those therapists with a baccalaureate degree in cardiopulmonary sciences. After considerable discussion, no specific recommendation was agreed upon at this time, however the tiered licensure option outlined above was determined to be the option most worthy of further discussion and research at this time.

It is important that the respiratory care community in the state continue the robust discussion of this vital topic and continue to examine the most viable options to move toward the baccalaureate.

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Patient Safety Perceptions of Respiratory Therapists Holding a Specialty Credential

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Abstract

Introduction: Data reporting patient safety attitudes of respiratory therapists in the United States is limited. Positive patient safety attitudes have been associated with improved outcome measures such as employee retention, reduced medication errors, and decreased length of stay. This study analyzed patient safety attitudes of respiratory therapists (RT) to determine which attributes correlated with a more positive patient safety score. Methods: A non-experimental, cross-sectional study design using the Safety Attitudes Questionnaire (SAQ) was employed. Subjects were required to be an RT and a member of the Virginia Society for Respiratory Care. Primary recruitment was through AARConnect with a link to the electronic survey. Variables were dichotomized by categorizing 6 attributes. A multiple regression model was deployed to determine which attributes lead to a more positive patient safety score. Results: 145 subjects completed the survey resulting in a 13% response rate. A multiple regression model indicated obtaining a specialty credential predicted a more positive patient safety attitude (F(7, 136)= 2.867, p= .008) among respiratory therapists, resulting in nearly 13% of the variance (R2=.129) for the SAQ scores. An unstandardized coefficient of 4.83 shows nearly a 5-point higher patient safety score for those who have a specialty credential compared to those who do not have a specialty credential. Additionally, there were significant outcomes associated with the RT's age and years of experience. Conclusion: These results are similar to data reported from the nursing literature on the benefits of obtaining a specialty credential. Further research should be conducted to determine the importance of obtaining a specialty credential, earning a BSRT, and obtaining the RRT credential, which could help to provide additional evidence-based recommendations for education and credentials.

Keywords: Respiratory therapy, patient safety, SAQ, safety, specialty credential, attitudes, respiratory care practitioner

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Information about the study:

Data collection was performed via an online survey tool. Study approved by Radford University IRB.

The original data collection was used for the completion of a doctoral capstone project at Radford University. An abstract version was accepted by RESPIRATORY CARE for print in October 2021 and an online poster presentation December 9, 2021, for AARC Congress 2021.

No conflict of interests to report.

Introduction

Developing a culture of patient safety is essential to improving outcome measures such as surgical site infection, length of stay in the intensive care unit (ICU), and hospital mortality.^{1,2} Adverse events are reduced in hospitals with higher safety attitude scores measured by survey tools.³ The focus on developing this culture of patient safety in the next generation of healthcare workers is inconsistent among respiratory therapy educational programs. Ideally, focusing attention on a culture of patient safety should start within these training programs. However, without a standardized approach, missed opportunities may occur, such as the association of positive safety attitudes with autonomy, understanding skill significance, and ultimately, enjoying the work itself. This has led some organizations to focus on a patient-centered culture to increase the use of evidence-based interventions, reduce medication errors, and improve employee retention.^{4,5} Conversely, low perceptions of patient safety attitudes among clinicians are linked to burnout, which negatively affects safety, patient care, and self-care.6,7

With the association between positive safety attitudes among clinicians and improved patient outcomes, it seems essential to assess clinicians' patient safety attitudes. Assessing patient safety attitudes among healthcare clinicians can be accomplished by the use of psychometric surveys.⁸ Several studies describe patient safety attitudes among specific clinicians such as physicians and nurses, while other research has focused on the multidisciplinary team aspect.⁹⁻¹⁵ To our knowledge there is only one study outside of the United States (U.S.) that specifically looks at patient safety attitudes among respiratory therapists. There are patient safety attitude studies that include respiratory therapists in the U.S. as part of the multidisciplinary team.^{4,12,16,17} To understand the patient safety attitudes of respiratory therapists in the U.S. this research study focused exclusively on the safety attitudes of respiratory therapists. Specifically, investigators looked to fill a void in the literature by assessing patient safety attitudes of respiratory therapists located in Virginia, an easily accessible group that may act as a proxy for a larger population, and determine if there are attributes that lead to a more positive patient safety attitude.

Methods

This IRB-approved study employed a non-experimental, cross-sectional study design utilizing a previously validated survey instrument to assess patient safety attitudes among respiratory therapists. An altered version of the Safety Attitudes Questionnaire (SAQ) originally developed by Sexton, et al. was used for data collection.⁸ The survey was adapted from the SAQ: Frontline Perspectives from this Patient Care Area and consisted of 36 questions along with eight demographic questions to assess attributes.⁸ The original version of the SAQ was not specific to respiratory

therapists; therefore, this study altered the original version of the SAQ. This altered version is referred to as the "Safety Attitudes Questionnaire for United States Respiratory Therapists" (SAQ-USRT). For example, the original SAQ question, "The physicians and nurses here work together as a well-coordinated team," was changed to "The physicians, nurses, and respiratory therapists here work together as a well-coordinated team."

The target population was licensed respiratory therapists who are members of the professional association, American Association for Respiratory Care (AARC). The sampling frame narrowed this group to the state of Virginia since these members were more accessible to the researchers. Survey invitations were emailed to all within this sample. At the time of the survey request in the Summer of 2020, there were 1,144 members listed on the state roster for the Virginia Society for Respiratory Care (VSRC)¹⁸ and there were 4,327 licensed respiratory therapists in Virginia.¹⁹ A convenience sample was used in an attempt to contact the 26% of the respiratory therapists in Virginia who chose to be members of the professional association. A \$100 lottery incentive was utilized to help improve the response rate.²⁰ The SAQ-USRT and demographic questions were available online via Qualtrics[™] from July 1, 2020, until August 12, 2020. During that time a representative from the AARC sent out three announcements for recruitment through AARConnect. A postcard mailer was also sent out to VSRC members with a QR code requesting their participation. Three advertisements also were made on the VSRC social media page.

The data were exported from Qualtrics^{XM} to Statistical Package for Social Sciences (SPSS) (Version 26.0) and missing data were excluded from analysis if the SAQ portion of the survey was not completed. The SAQ data uses a 5-point response scale ranging from Disagree Strongly to Agree Strongly, which was converted to a 100-point scale as recommended by the original SAQ authors.8 The SAQ-USRT includes the six domains determined by the original SAQ authors: teamwork, safety, job satisfaction, stress recognition, perceptions of management, and working conditions.8 Eight demographic questions were assessed in the survey based upon the researchers' hypothesis on which attributes may affect patient safety attitudes. The attributes that were specifically analyzed were age (40 years old or older), experience (10 or more years of experience), sex, bachelor's degree or higher in respiratory therapy, bachelor's degree or higher in any field, RRT (registered respiratory therapist) credential, and specialty credential.

Results

Of the 1,144 potential respondents who received the survey, 176 opened and started the survey, but only 145 provided sufficient data for analysis, resulting in a 13% response rate. The median age of subjects was 51 years, and the majority of the subjects were female (60%) (Table 1). Fewer than 30% of the subjects reported having a baccalaureate or graduate degree in respiratory therapy, but 65% reported having a baccalaureate or a graduate degree of any type. The majority (90%) of subjects had obtained the RRT credential and over 50% reported having a specialty credential (Table 2). Over 75% also reported having at least 10 years of experience.

Table 1 Demographic Profile of Participants

Demographic Variable	Ν	Response %
Responses	145	100.0%
39 years old or younger	34	23.4%
40 years old or older	111	76.6%
Responses	145	100.0%
Female	89	61.4%
Male	56	38.6%
Responses	145	100.0%
9 years of experience or more	34	23.4%
10 years of experience or more	111	76.6%

Table 2 Demographic Profile of Education

Profile of Education	N	Response %			
Respiratory Therapy Degree					
Responses		100.0%			
BS or MS in Respiratory Therapy	43	29.7%			
No BS or MS in Respiratory Therapy	102	70.3%			
Bachelor's or Graduate Degree (any degree)					
Responses	145	100.0%			
Bachelor's or Graduate Degree	93	64.1%			
No Bachelor's or Graduate Degree	52	35.9%			
Highest Respiratory Therapy Credential					
Responses	145	100.0%			
Certified Respiratory Therapist	9	6.2%			
Registered Respiratory Therapist	136	93.8%			
Specialty Credential (any)					
Responses		100.0%			
Yes	81	55.9%			
No	64	44.1%			

The SAQ-USRT exhibited a very high level of internal consistency, with a Cronbach's alpha of 0.933 when assessing all 36 scale items. When individually assessing the six domains the scale showed good internal consistency,

with all domains reaching the accepted value of 0.7 or greater. For each domain topic, a score below 75 is interpreted as a negative response. Based on mean values, teamwork climate (81.64), safety climate (80.17), and job satisfaction (79.07) resulted in positive responses. Stress recognition (58.15), perceptions of management (68.76), and working conditions (63.75) scored negatively. The Shapiro-Wilk test was used to determine normality of the data. Since none of the six domain items met this threshold, the Mann-Whitney U test was used to compare groups.

Each of the patient safety domains (teamwork climate, safety climate, job satisfaction, stress recognition, perceptions of management, and working conditions) was analyzed for differences using the specific attributes of 10 or more years of experience, 40 years old or older, a BSRT or graduate degree in respiratory therapy, a specialty credential, an RRT credential, and a bachelors or graduate degree not specific to respiratory therapy. Respiratory therapists who were 40 years old or older had significantly more positive patient safety attitudes in the domains of teamwork climate (p = .034, U = 2338, z = 2.117), job satisfaction (p = .022, U = 2374, z = 2.287), perceptions of management (p = .001, U=2587, z = 3.272), and working conditions (p = .002, , U=2539, z = 3.057). Respiratory therapists who had 10 or more years of experience had significantly more positive patient safety attitudes in the domains of safety climate (p = .043, U = 2184, z = 2.019), perceptions of management (p = .005, U = 2353, z = 2.831), and working conditions (p = .047, U = 2177, z = 1.988). Lastly, respiratory therapists who had achieved a specialty credential had significantly more positive patient safety attitudes in the domains of safety climate (p = .038). U = 3110, z = 2.071), stress recognition (p = .028, U = 2041, z = -2.20), and perceptions of management (p = .042, U = 3102, z = 2.033).

A multiple regression model using the total scale item score on the SAQ-USRT was used to determine which attributes were the best predictors of positive safety attitudes. Having a specialty credential and age were the only significant predictors, and they accounted for almost 13% of the variability in patient safety attitude scores (R^2 = .129), a medium-size effect²², *F*(7, 136) = 2.867, p = .008.²² Each year of age added about a third of a point to the total score. The most significant finding in this study was the outcome of having a specialty credential resulting in a 4.834 increase in the total score. This shows nearly a 5-point higher patient safety score for those who hold a specialty credential.

Discussion

The results of this study suggest that independent of the experience that presumably comes with time, the most important attribute related to having a positive patient safety attitude among respiratory therapists is obtaining a specialty credential. Our findings also suggest respiratory therapists have a positive patient safety attitude in the domains of teamwork, safety, and job satisfaction. However, this study did discover a somewhat negative perception of patient safety in the domains of stress recognition, perceptions of management, and working conditions.

The importance of a specialty credential is not unique to respiratory therapists. Research data from nursing literature shows those who have obtained a specialty credential also have an increase in job satisfaction and improved patient safety outcomes.^{23,24} Further research into patient outcomes among healthcare professionals with specialty credentials is needed. The findings of this study help to associate the similarities between respiratory therapists and nurses, as described in the nursing literature, in obtaining specialty credentials.

The results also showed respiratory therapists had a positive patient safety attitude towards teamwork, safety climate, and job satisfaction. Overall, the respiratory therapists who completed the survey showed a positive attitude towards patient safety, which signifies their understanding of the importance of providing an environment of safe patient care. This is an important finding because positive patient safety attitudes are linked to measures of job satisfaction such as enjoying the work itself, autonomy, and skill significance. This may be noticed by potential career seekers and assist with attracting students to respiratory therapy programs.

Somewhat negative perceptions of patient safety were identified in the areas of stress recognition, perceptions of management, and working conditions. It is not surprising that stress recognition was an area that scored low on the survey. Respiratory therapists are often in high-stress situations, working in intensive care units of hospitals or responding to medical emergency events such as cardiac arrests. These situations result in high-stress working conditions, which may lead to burnout. Research regarding burnout among respiratory therapists found that most respondents experienced burnout, but many did not use resources available to combat burnout effects.²⁵ It will be important to further investigate these results and develop strategies to prevent respiratory therapists from burnout, which affects many healthcare workers across all disciplines.^{7,26} Some of the negative attitudes could have resulted from higher than usual workload demands due to the COVID-19 pandemic. Generally, hospitals have nursing and physician-patient ratios which require restricting new patients if those ratios have been met. However, respiratory therapists are not typically included in this decision, which could result in unsafe workloads and further compromise safety. In times of high acuity, the availability of respiratory therapists should be considered when determining adequate staffing for patient safety.

An expected difference between respiratory therapists who hold a baccalaureate degree or graduate degree in respiratory therapy compared to respiratory therapists without a baccalaureate degree or graduate degree in respiratory therapy did not occur in our results. This could be due to the sample size of the study or the inclusion of only members of the professional association. Alternatively, the difference could also be explained by the high percentage of subjects who hold a baccalaureate degree or graduate degree not specific to respiratory therapy. Further research should be conducted to determine the importance of earning a specialty credential, obtaining a baccalaureate or graduate degree in respiratory therapy, as well as obtaining the RRT credential. The SAQ-USRT could be an effective tool to measure the differences in these attributes on a larger scale. This research could lead to evidence-based recommendations for education and credentialing for entry-to-practice in the profession and beyond.

Limitations

The most significant limitation of this study is the inability to survey a random sample of all respiratory therapists in Virginia or the United States. The usual caveats regarding generalizing from a convenience sample apply. Data collection occurred during the COVID-19 pandemic and that could have altered the number of responses as well as the attitudes of respiratory therapists due to their involvement in the pandemic. The low survey response rate could introduce biases that produce considerable impact on the results along with the inability to assess other variables such as past training or burnout.

Conclusion

This study found participating respiratory therapists had a positive patient safety attitude towards teamwork, safety, and job satisfaction. Negative perceptions of patient safety were identified in the domains of stress recognition, perceptions of management, and working conditions. Overall, it was determined that achieving a specialty credential contributed to a positive patient safety attitude in respiratory therapists. Further research is needed to determine the validity of these results on a larger scale and among respiratory therapists who are not members of the AARC.

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