

**Early Career Respiratory Therapist Perceptions of Their Readiness to Work
Independently After Completing Clinical Simulation Practices in a Respiratory Care
Program**

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Abstract

Early-career respiratory therapists face significant challenges when transitioning from an academic setting to professional practice, particularly regarding their perceived readiness to work independently within interdisciplinary healthcare teams. The purpose of this qualitative case study was to examine the experiences and perspectives of early-career respiratory therapists regarding their transition from an academic setting to the early years of practice, as reflected in written and clinical simulation examinations. The theoretical framework that guided the study was Miller's information processing theory. Convenience sampling was used to recruit 11 early-career respiratory therapists who transitioned into clinical practice within the last three years. Data collection combined the use of a criterion questionnaire, semi-structured interviews, and an interview guide. The research questions included: (a) What are early-career respiratory therapists' perspectives regarding their skills in working with interdisciplinary preparedness to transition into the workforce after completing the clinical simulation examinations? (b) What do early career respiratory therapists perceive as factors of the simulation practices that facilitated or interfered with preparedness to work independently when entering the workforce, particularly within interdisciplinary teams? (c) What are early-career respiratory therapists' perspectives regarding preparedness to approach the credentialing examinations? A reflexive thematic analysis method was used to analyze the data. The results demonstrated that clinical simulation practices are crucial for training early-career respiratory therapists to work effectively in teams. However, there are still areas that need improvement to better prepare graduates for professional practice. Based on the findings, a more systematic approach is needed when training respiratory therapists for clinical practice, as technical skills alone are insufficient; interpersonal and emotional skills are also needed.

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Chapter 1: Introduction

Respiratory therapists have a significant role in healthcare, providing vital services to meet the needs of patients, family members, and medical staff (American Association for Respiratory Care [AARC], 2023). Respiratory therapy, formerly referred to as inhalation therapy, originated in 1943 and was directed by Dr. Edwin R. Levine; it officially became a profession in 1947 (AARC, 2023). In 1943, on-the-job training was required for practicing as an inhalation therapist. The first registry exams were administered in 1960 (AARC, 2023). The first state in the United States to require licensure was California in 1982. By the year 2004, every state in the U.S. required licensure to practice respiratory therapy (AARC, 2023). Over the past 77 years, the profession has advanced in education, research, technology, and patient care.

Early career respiratory therapists are expected to enter the workforce with skills to build upon as they gain experience (Behr et al., 2022). To become a registered respiratory therapist, the completion of a two-year degree in respiratory care and passing scores on a two-part examination through the National Board of Respiratory Care (NBRC) are required. The examinations consist of the Therapist Multiple-Choice (TMC) and the Clinical Simulation (The National Board of Respiratory Care [NBRC], 2023). The two-part examination consists of the therapist multiple-choice assessment, a prerequisite for the clinical simulation assessment (Terry & Ari, 2022). Respiratory therapists place focus on the function of cardiopulmonary, specifically concentrating on the lungs (AARC, 2023). Respiratory therapists work in various settings, such as acute care hospitals, urgent care settings, emergency departments, rehabilitation facilities, home health, and nursing homes (AARC, 2023). With saving lives and improving health, duties that respiratory therapists must perform include patient assessment, initiation of chronic and acute care disease protocols, medical gas administration, bronchial hygiene therapy,

administering medication, assessment of the airway, blood sampling, hemodynamic monitoring, and artificial airway care (AARC, 2023). To acquire needed skills, simulation practices are one method used in respiratory care programs for training and preparation for entering the workforce (Yanes & Nastars, 2022). Simulation is used as a learning tool during clinical practices as students advance through the program. The use of simulation allows students to build competencies of critical thinking, the use of medical equipment, communication, collaboration, and human physiology prior to entering the workforce (AARC, 2023; Culbreth et al., 2021).

Davis et al. (2022) suggested that the use of simulation practices has a positive impact on student achievement by allowing students to receive hands-on training. Khathlan et al. (2022), Violato (2022), Terry and Ari (2022), and Ogrodnick et al. (2020) have expressed that simulation practices allow students to advance in skills such as patient interaction, reasoning, identifying and correcting mistakes, addressing issues in a real clinical setting, and an increase in assessment scores; still, early career respiratory therapists face barriers when entering the workforce. It is not known how previous students experience and view the transition from the academic setting through written and clinical simulation examinations when entering the workforce (Varekojis et al., 2022). This topic is important because when early career respiratory therapists enter the workplace, it is essential that they can effectively adapt, communicate, and perform the required duties while supporting the patient (Krielen et al., 2023).

Statement of the Problem

The general problem addressed in this study was that early-career respiratory therapists are entering practice with insufficient preparation (Baoum et al., 2023; Piccuito & Santiago, 2023). Clinical simulation practices are one of the significant learning tools that were impacted by the coronavirus disease pandemic (COVID-19), preventing the development of needed skills

for entering the workforce (Varekojis et al., 2022). The specific problem addressed by this study was that COVID-19 illuminated the needed skills for entering the workforce, leaving recent graduates unprepared for their clinical simulation examinations and uncertain about the transition from their academic programs through written and clinical simulation examinations and into early years of practice (Varekojis et al., 2022). As a result, it is currently not known how recent graduates experience the transition from their academic programs through written and clinical simulation examinations and into the early years of practice (Varekojis et al., 2022). When early-career respiratory therapists are not fully prepared, medical facilities are impacted by having to provide additional training (Erkinger et al., 2022). The Commission on Accreditation for Respiratory Care (CoARC) lists 451 accredited respiratory care programs in the U.S. (CoARC, 2023). According to the National Board for Respiratory Care (NBRC), in 2022, 9,055 clinical simulation examinations were administered in the U.S., with only 5,189 being awarded credentials and 53.8% being repeated candidates (NBRC, 2023). Addressing this problem will help to understand what factors influence early-career respiratory therapists' preparedness for entering the workforce.

Purpose of the Study

The purpose of this qualitative case study was to examine the experiences and perspectives of early-career respiratory therapists regarding their transition from the academic setting through written and clinical simulation examinations and into the early years of practice. The focus was on exploring individual experiences with simulation practices and how they related to the preparedness of early-career respiratory therapists when entering the workforce. Understanding the experiences and perspectives of how previous students acquired preparation through clinical simulation can address the problem of early-career respiratory therapists

entering practice with insufficient preparation. In-depth descriptions of lived experiences and views of early-career respiratory therapists and the challenges they face when entering the workforce were acquired in this study. A case study design allowed for an in-depth understanding of experiences and perspectives about factors regarding clinical simulation practices regarding the transition of early career respiratory therapists from the academic setting into the workforce (Wienclaw, 2021). The population consisted of early-career respiratory therapists within their first three years of practice who had completed a respiratory care program in the United States. Convenience sampling was used to obtain participants who met the criteria of participating in clinical simulation practices as they advanced through the program (Henry, 1990). The sample size included 11 participants who met the criteria and were willing and able to participate. Data collection was monitored by searching for repeated patterns and new ideas. When repeated patterns and new ideas were no longer identified, saturation was met. Interviews and questionnaires were used to collect data. The purpose was aligned with the research problem, examining early-career respiratory therapists' beliefs and experiences on their preparedness to work independently after entering the workforce.

Introduction to Theoretical Framework

The theoretical framework that was used to guide the study is Miller's (1994) information processing theory. Miller's theory focuses on how individuals learn through memory and explains how individuals capture information meaningfully and reserve it for future use (Miller, 1994). The theory has three major factors, which are elements of knowledge that are collected, the thought process, and executive cognition (Miller, 1994). The information processing theory has been used as a framework for various studies. Loc et al. (2019) applied the theory to their research to determine the efficacy of instructional methods for math and found that through a

teaching model based on the concepts of the information processing theory, students were able to relate in a constructive manner. Kristayulita and Sucipto (2022) also used the information processing theory to understand how students learn through remembering math concepts based on the factors of the theory.

Information processing theory is based on memory functions and how the brain processes information, with having factors of knowledge that are collected, thought process, and executive cognition (Miller, 1994). Through encoding and retrieval, information is analyzed, learned, and retrieved. The long-term memory holds information that has been learned. The short-term memory may store up to nine pieces of information at once (Miller, 1994). The Information processing theory can guide the proposed study by focusing on how information is processed through students' memory as they advance through a respiratory care program when applying simulation practices to reasoning, motor, and technical skills. Applying the factors of students collecting knowledge, the process of thought, and direct understanding will help to develop an understanding of how instructional methods influence what students remember (Miller, 1994). As students go through clinical simulation practices, learning takes place through student reasoning abilities that may reflect on different stages of memory (Lang et al., 2022). Li et al. (2023) conducted a study using the information processing theory as a guide to capture the influences of medical students' recollection as simulation practices were used to assess patient diagnostics. Their study demonstrated that the information processing theory can be used to evaluate interactions among students as they learn through the process of thought and memory while using simulation practices (Li et al., 2023). The Information processing theory can help to better understand how instructional methods affect student achievement in clinical simulation practices.

Introduction to Research Methodology and Design

A qualitative case study allowed a thorough investigation of the experiences and perspectives (Hill et al., 2005; Yin, 2018) of respiratory therapists as they transition into their early careers. Hill et al. (2005), Im et al. (2023), and Yin (2018) all agreed that interviews, observations, and document analysis are suitable forms of data collection for a case study. These methods can be used to uncover the nuances of career preparedness (Im et al., 2023). Case study research recognizes that individual, organizational, and environmental factors influence career preparedness (Yin, 2018; Sreedharan et al., 2022). By focusing on particular contexts, researchers can identify the unique factors that contribute to the successes and challenges of the transition from the educational setting to practice and provide individualized suggestions for improvement (Im et al., 2023).

Qualitative case study research is ideally adapted for identifying the barriers and facilitators (Hill et al., 2005) that influence the preparedness (Im et al., 2023) of early-career respiratory therapists. By identifying these factors, stakeholders can develop targeted strategies (Im et al., 2023) to improve career readiness and assist early-career professionals. A qualitative case study approach allows researchers to consider the interaction between personal, social, and structural factors that influence career readiness (Kentish-Barnes et al., 2021). This holistic perspective is useful for understanding the complex dynamics that influence the experiences of respiratory therapists early in their careers and for identifying improvement and intervention areas. The findings of qualitative case studies can assist in informing the design and administration of respiratory therapy education programs (Heisler & Myers, 2021). Educators can better design their curriculum for future respiratory therapists' needs if they understand the areas in which early-career professionals feel most prepared or challenged (Pyo et al., 2023).

Research Questions

The research questions were developed to better understand what factors may influence the preparedness of early career respiratory therapists as they transition from the academic setting through written and clinical simulation examinations and into the early years of practice.

RQ1

What are early-career respiratory therapists' perspectives regarding their skills in working with interdisciplinary preparedness to transition into the workforce after completing the clinical simulation examinations?

RQ2

What do early-career respiratory therapists perceive as factors of the simulation practices that facilitated or interfered with preparedness to work independently when entering the workforce, particularly within interdisciplinary teams?

RQ3

What are early-career respiratory therapists' perspectives regarding preparedness to approach the credentialing examinations?

Significance of the Study

Similar to Kentish-Barnes et al. (2021), a qualitative case study can be used to identify knowledge or skill deficits, informing the design of targeted professional development programs for respiratory therapists early in their careers. This may include mentorship programs, opportunities for continuing education, and resources for enhancing clinical skills and competencies. Understanding the factors that contribute to career preparedness can aid in identifying strategies to support early-career respiratory therapists in their transition to practice, with increasing job satisfaction and retention rates within the profession (Heisler & Myers,

2021). Improving the career readiness of respiratory therapists ultimately contributes to improved patient care and outcomes, as well-prepared professionals are better equipped to meet their patients' complex requirements (Sreedharan et al., 2022). The insights obtained from qualitative case study research can support the growth and evolution of the respiratory therapy profession by informing policy development and advocacy efforts.

New knowledge that can be gained by conducting this study will help respiratory care programs to better understand what factors are associated with instructional methods that may cause early-career respiratory therapists to enter practice with insufficient preparation (Varekojis et al., 2022). This study may also help to understand the role that faculty training plays in instructional methods used in clinical simulation (Davis et al., 2022). This study is important because it will produce new knowledge through student perceptions of how instructional methods are used in clinical simulation practices in respiratory care programs. Developing instructional methods that reflect in all areas of practice is needed to promote success in clinical preparedness and patient care (Munna, 2023). Instructional leadership has an influence on curriculum design and methods used to carry out class activities (Munna, 2023). For example, White (2021) found that instructional leadership has a role in student success. Planning and presenting learning goals are also essential parts of integrating effective simulation methods (White, 2021). Davis et al. (2022) found that the success of clinical simulations is directed toward instructional leadership by providing instructional methods that will be effective in all areas.

Definitions of Key Terms

Career Preparedness

Sometimes referred to as career readiness, career preparedness relates to the possession of both the tangible and intangible competencies, as well as experience, necessary to perform an occupation in a professional manner (NACE, 2023).

Clinical Simulation

Clinical simulation is the practice of teaching and learning professional skills in simulated environments where no harm or danger exists to a real human subject (Coro-Montanet et al., 2023).

Clinical Simulation Examination

The clinical simulation examination for respiratory care consists of 22 problems with four hours for completion. The examination assesses the professional skills and competencies related to the clinical practice of respiratory therapists (NBRC, 2023).

Early Career Respiratory Therapist

For this study, an early career respiratory therapist is a professional within the field who has met all professional competency requirements, has gained employment in a qualifying facility, and is within the first three years of having entered the field (Miller et al., 2021).

National Board for Respiratory Care

The National Board for Respiratory Care is an organization that was created in 1960 and consists of 19 members who hold seats on the board of trustees (NBRC, 2023). Seven different credentials are awarded through the NBRC. Credentials that can be awarded are certified respiratory therapist (CRT), registered respiratory therapist (RRT), adult critical care,

neonatal/pediatrics, pulmonary function technology, asthma education, and sleep disorders (NBRC, 2023).

Respiratory Therapist

A respiratory therapist is a certified medical professional specializing in treating and preventing respiratory illnesses (NBRC, 2023). To become a registered respiratory therapist, the completion of a two-year degree in respiratory care and passing scores on a two-part credentialing examination are required (NBRC, 2023).

Summary

The purpose of this study was to explore the experiences and perspectives of early-career respiratory therapists regarding their transition from an academic setting through written and clinical simulation examinations into the early years of practice. The pandemic of coronavirus disease (COVID-19) had a significant impact on clinical simulation practices, one of the most important learning instruments (Varekojis et al., 2022). A lack of effective training for students in clinical simulation practices affects the preparedness of respiratory therapists early in their careers, and additional training has an impact on medical facilities (Davis et al., 2022; Erkinger et al., 2022). There are currently 451 accredited respiratory care programs in the United States (CoARC, 2023). Statistics show that out of 9,055 clinical simulation examinations administered in the United States in 2022, only 5,189 were awarded credentials (NBRC, 2023). By addressing this issue, a better understanding of the factors that may cause barriers to workforce readiness for respiratory therapists as they transition from the learning environment into the workforce can be achieved. Case study research is best for identifying the barriers and facilitators that impact the preparedness of respiratory therapists early in their careers. Case studies allow researchers to consider the interaction between personal, social, and structural factors that impact career

readiness (Yin, 2018; Sreedharan et al., 2022). The results of this qualitative case study can inform the development and administration of respiratory therapy education programs.

Chapter 2: Literature Review

The purpose of this qualitative case study is to examine the experiences and perspectives of early-career respiratory therapists regarding their transition from the academic setting through written and clinical simulation examinations and into the early years of practice. The problem that was addressed in this study is that the COVID-19 pandemic and subsequent restrictions on clinical practice have hindered the acquisition of needed skills for entering the workforce (Varekojis et al., 2022). Specifically, recent graduates of respiratory care programs struggle with their clinical simulation examinations and are unprepared for the transition from their academic programs, through written and clinical simulation examinations, into the early years of practice (Varekojis et al., 2022). Researchers in the field of respiratory care have called for more studies regarding the education of respiratory therapists and how it can better prepare them for practice (Mathew et al., 2023; Varekojis et al., 2022).

The profession of respiratory therapy began in 1943 and has advanced over the past 80 years (American Association for Respiratory Care [AARC], 2023). Today, the profession is highly recognized, with approximately 272,000 therapists throughout the United States (NBRC, 2023). However, as medical care advances, the field of respiratory care changes. Through the advancement of technology, the profession of respiratory care continuously develops new practices and educational methods that support all stakeholders (NBRC, 2023). When early-career respiratory therapists enter into practice, they are expected to contribute to the allied health profession (Dubois et al., 2021) by practicing learned skills and building their knowledge base. Exploring this research will help understand the related issues associated with transitioning from being a student to entering practice as an early-career respiratory therapist.

In this chapter, existing literature surrounding the problem and other relevant topics is reviewed to identify gaps in the literature and guide the rest of the study. The chapter begins with an introduction to the topic, followed by a discussion of the theoretical framework that guides the study. The information processing theory (Miller, 1956) guided the study by exploring the learning aspects of how students perceive and remember learning objectives as they go through a respiratory care program and how it reflects entering practice. The main body of the literature review contains various facets of the profession using themes and subheadings. This review of literature begins with a brief description of the historical development of respiratory therapy and leads into the review using the themes of respiratory therapists and respiratory education. The two themes use various subtopics, such as the respiratory therapy profession, the roles of respiratory therapists, and the skills expected from respiratory therapists. Numerous instructional methods are also explored in the literature, which can prepare students for clinical practice. This is shown through the subtopics of instructional methods for medical fields, specialized training for respiratory education, modalities used in respiratory education, faculty role in respiratory education, use of simulation in clinical education and preparation, forms of simulation-based education, and advantages and disadvantages of simulation-based training. The literature that was examined from each subtopic is relevant to respiratory care education and practice.

A search strategy was used to ensure the recency and relevance of the literature review. The literature used in this study was identified from peer-reviewed journals, organizations such as the National Board of Respiratory Care (NBRC) and the Commission on Accreditation for Respiratory Care (CoARC), reports, and book chapters ranging from 2019 to 2024. Search methods that were used included various databases and search engines. Databases from the National University Library's EBSCOhost research platform consisted of APA PsycArticles,

CINAHL Complete, Directory of Open Access Journals, Education Research Complete, Eric, Gale Academic OneFile, Journals@OVID, MEDLINE Complete, and Supplemental Index.

Search engines that were used are Google, Google Scholar, and Roadrunner Search. The search parameters were within the past five years, excluding seminal research. Search terms that were used to conduct the review included *respiratory therapist, respiratory care, respiratory care education, clinical simulation, clinical simulation in respiratory education, information processing theory, history of respiratory therapy, allied health, clinical practice, health science education, simulation-based learning, NBRC, AARC, student readiness in respiratory practice, qualitative research, clinical skills in respiratory, career readiness, and new graduate respiratory therapist*. The search terms were used individually and in combination with each other using the Boolean terms “AND” and “OR” across the search engines and databases.

Theoretical Framework

The theoretical framework that guided this study was Miller’s (1994) information processing theory. George A Miller developed the information processing theory in 1956. Miller related the process of the theory to how computers operate regarding the memory process (Rosnov & Roberts, 2005) in his much-cited publication, *The Magical Number Seven, Plus or Minus Two* (Miller, 1994). Miller’s theory focuses on how individuals learn through memory. The information processing theory explains how individuals capture information in a meaningful way and reserve it for future use (Miller, 1994). The theory has three major stages that create the processing cycle. The first stage is to collect and symbolize information. The next two stages are the retaining and recovery stages (Miller, 1994). Through encoding and retrieval, information is analyzed, learned, and later retrieved. The long-term memory holds information that has been learned. The short-term memory may store up to nine pieces of information at once (Miller,

1994). For example, visual information typically lasts half a second, while auditory information lasts approximately three seconds in the sensory memory. The next stage involves retaining the information in the short-term and then long-term memory. Important aspects of the information are stored in the short-term memory for approximately 15 to 30 minutes (Krishnamoorthy et al., 2021; Sanongdej et al., 2021; Stout & Klett, 2020). Short-term memory is considered the active component of one's memory, as it contains information that is either quickly used or processed further into long-term memory. However, long-term memory stores information permanently and in a dormant manner. The third stage involves the recovery stage, in which the information is retrieved from long-term memory. Retrieval from long-term memory depends on its similarity with how it is stored. The more similar the retrieval process is to the storing process, the easier it is to retrieve the information (Krishnamoorthy et al., 2021; Sanongdej et al., 2021; Stout & Klett, 2020). The principles make the information processing theory relevant to training and education, and how lessons can be stored and retrieved by students (Mayer, 1975).

The information processing theory was further developed by psychology professors Richard Atkinson and Richard Shiffrin in 1968 when they proposed a linear process of the human memory (Loc et al., 2019; Stout & Klett, 2020). They also proposed that rehearsal enhances the process of transferring information to long-term memory. Fergus Craik and Robert Lockhart (1972) also contributed to the information processing theory, suggesting that the ability to remember can be influenced by attention and depth of processing. Throughout history, the information processing theory has evolved into a prominent cognitive learning theory that explains how humans observe, save, and retrieve information (Loc et al., 2019; Stout & Klett, 2020).

The information processing theory has been used as a framework for various studies in the past. Loc et al. (2019) applied the theory to their research to determine the efficacy of instructional methods for math. A teaching model was developed based on the information processing theory, in which teachers provided an engaging learning environment for information input. Students consolidated the new information with old knowledge for processing, and teachers supported students in coding, consolidating, and giving meaning to the new information for storage (Loc et al., 2019). The authors found that through this teaching model, students were able to relate and learn in a constructive manner (Loc et al., 2019). Similarly, Nassar et al. (2021) used the information processing theory to develop a specific model for motor learning. In accordance with the information processing theory, the motor learning model involved a cognitive stage, in which students identified and understood the skill using limited movement; the associative stage, in which students learned the response for specific stimuli through practice and feedback; and the autonomous stage, where the motor skill learned from previous stages became automatic and required little cognition, allowing for easier retrieval when needed (Nassar et al., 2021). This model, connected with virtual reality technology, can be helpful in enhancing technical skills in the field of medicine by going through the stages of information processing and storing the skills within one's memory (Nassar et al., 2021). Li et al. (2023) conducted a study using the information processing theory as a guide to capture the influences of medical students' recollections as simulation practices were used to assess patient diagnostics. Their study demonstrated that the information processing theory can be used to evaluate interactions among students as they learn through the process of thought and memory while using simulation practices (Li et al., 2023). These studies displayed the functionality of the information processing theory as a foundation for educational models.

The information processing theory has also been used as a framework for specific teaching methods. In line with the principles of the information processing theory, Sanongdej et al. (2021) developed and assessed a small private online course (SPOC) for nursing students. The results of their assessment indicated that the course content did not directly influence participants' skills, but online characteristics, such as accessibility and student-teacher interaction, significantly and directly influenced participants' skills and learning process (Sanongdej et al., 2021). Online media and characteristics also indirectly influenced physical examination ability through the learning process. Online characteristics and media served as catalysts for the content or information to be stored in long-term memory and retrieved as needed (Sanongdej et al., 2021). Ladendorf et al. (2019) suggested that immersive virtual reality (IVR) platforms for learning would be effective as they maximize sensory input and allow a continuous flow of information to the short-term and then long-term memory. However, they also cautioned that IVR may lead to cognitive overload as the brain struggles to register a large amount of information at once (Ladendorf et al., 2019). Ladendorf et al. recommended a balance between a virtual environment that is strong enough to activate the long-term memory but with a limited scope in order not to distract users and overload their senses and cognition. Finally, Krishnamoorthy et al. (2021) highlighted the theory's principle that retrieval from long-term memory depends on its similarity with how it is stored. This principle may explain why simulations, which are more similar to actual practice than theoretical learning and provide more realistic information that engages multiple senses, may be effective for some learners. However, more evidence is required to determine its relationship with learning styles. These studies demonstrated that the information processing theory can be used to evaluate the effectiveness of teaching methods.

Other frameworks considered for this study were adult learning theory and transformative learning theory. The adult learning theory is based on the idea that adults learn differently from children, relying more on real-life experiences, approaching learning with their own unique ideas, learn from various domains, and achieving greater learning through active reflection (Knowles, 1980; Matics, 2015). Adults are also more motivated to learn when they recognize the relevance of the lesson to their jobs (Brown et al., 2022). These principles may explain how experiential or hands-on learning of related content can be effective for adults. However, a disadvantage of the adult learning theory is that it focuses too much on learning and the storing process, but not on how the knowledge and skills can be retrieved and applied in practice. Therefore, the adult learning theory is not suitable for the present study.

The transformative learning theory is focused on critical reflection and meaning-making (Briese et al., 2020; Buttigieg & Calleja, 2021). Based on this theory, adults learn from a confusing dilemma or a stressful experience that leads to a transformation of the learner's assumptions and personal paradigms (Mezirow, 1997; Briese et al., 2020; Buttigieg & Calleja, 2021). This principle may be used to explain how students learned through the COVID-19 pandemic, which is a confusing dilemma (Vipler et al., 2022), or how simulations presenting clinical dilemmas allow students to think critically and resolve the dilemma (Briese et al., 2020). Previous researchers have criticized the transformative learning theory, suggesting that learning does not always occur because of confusing dilemmas (Briese et al., 2020). In addition, the transformative learning theory does not fully explain how the learned knowledge or skills are retrieved and applied into practice.

The information processing theory can guide the proposed study by focusing on how information is processed through students' memory as they advance through a respiratory care

program when applying simulation practices and transitioning into clinical practice. Applying the factors of students collecting knowledge, the process of thought, and direct understanding will help to develop an understanding of how instructional methods influence what students remember (Miller, 1994). As students go through clinical simulation practices, learning takes place through student reasoning abilities that may reflect on different stages of memory (Krishnamoorthy et al., 2021; Lang et al., 2022; Sanongdej et al., 2021). The Information processing theory can help to better understand how instructional methods affect student achievement in clinical simulation practices.

History of Respiratory Therapy

Respiratory therapy can be dated back as far as 1943 in Chicago, Illinois, beginning with a small program that administered inhalation therapy directed by Dr. Edwin R. Levine (AARC, 2023). Technicians who administered such treatments were known as inhalation therapists. From 1946 through 1970, the new profession underwent major transformations that included forming associations, establishing educational guidelines, and guidelines for practice (AARC, 2023). In 1973, inhalation therapy officially became known as respiratory therapy and underwent further developments in examinations, credentials, and licensure (AARC, 2023). Currently, the profession of respiratory therapy has approximately 272,000 therapists throughout the United States and is growing (NBRC, 2023).

The respiratory care profession has rapidly developed and is now practiced throughout the world in countries such as Canada, France, Germany, Italy, the Philippines islands, Saudi Arabia, Singapore, and Taiwan (Association of Respiratory Therapists Singapore [ARTS], 2021; European Respiratory Society [ERS], 2023; German Respiratory Society [GRS], 2023; International Council for Respiratory Care [ICRC], 2013; Italian Association for Respiratory

Care [IARC], 2014; Saudi Critical Care Society [SCCS], 2020; Taiwan Society for Respiratory Therapy [TSRT], 2022; Zaccagnini et al., 2021). Respiratory practices and guidelines in Canada are most similar to the practices and guidelines of the United States, while other countries vary in the areas of education, training, and certification (Zaccagnini et al., 2021). With the development of the respiratory care profession, organizations work together to promote and support respiratory therapy by working towards goals and having a purpose. Organizations such as the National Board for Respiratory Care, the Association for Respiratory Care (AARC), the American College of Chest Physicians (CHEST), the American Society of Anesthesiologists (ASA), and the American Thoracic Society (ATS) are motivated through education and research to reach the most advanced levels of excellence (NBRC, 2023).

Becoming a Respiratory Therapist

Respiratory therapists are allied health professionals who specifically place focus on the lungs. Within the profession, a wide range of duties are performed that require interaction with patients, family members, and medical associates, including physicians, nurses, medical assistants, and lab technicians (Department of Labor, 2023). The minimum educational requirement to become a respiratory therapist in the U.S. is an associate degree from an accredited respiratory care program (AARC, 2023). After completing a respiratory care program, students become eligible to take credentialing examinations. Across the U.S., all credentialing examinations have the same guidelines and are administered through the NBRC (NBRC, 2023). The examinations consist of two separate tests. The first test is the Therapist Multiple-Choice Examination (TMC). The TMC examination has a total of 160 questions that are multiple-choice, with only 140 questions being counted towards the overall score. Throughout the exam, 20 questions are pretest items. The examination has a time limit of three hours for completion

(NBRC, 2023). The examination is categorized into three distinctive areas that include patient data, troubleshooting and quality control of devices, infection control, and initiation and modification of interventions (NBRC, 2023). Scoring is evaluated on high-cut scores and low-cut scores. Candidates who achieve a high-cut score are awarded the credential of certified respiratory therapist (CRT) and become eligible to take the clinical simulation examination. Candidates who achieve a low-cut score will also be awarded the credential of certified respiratory therapist, but will not be eligible to take the clinical simulation examination (NBRC, 2023).

The clinical simulation examination consists of 22 items, including 20 scored items and two pretests. The examination has a four-hour time limit, focusing on areas such as patient data, troubleshooting, device quality control, infection control, and initiation and modification of interventions (NBRC, 2023). Candidates who successfully achieve a passing score will be awarded the credential of Registered Respiratory Therapist and may apply for state licensure. However, revisions are set to begin in January 2027, completely removing the clinical simulation examination from the credentialing testing process for respiratory therapy (AARC, 2023). The revisions will consist of only one multiple-choice examination and will be renamed the Respiratory Therapy Examination. Candidates receiving a low-cut or higher-cut score will determine whether the CRT or RRT credential is awarded (AARC, 2023).

Additional certifications that can be achieved through examinations include Certified Pulmonary Function Technologist, Registered Pulmonary Function Technologist, Adult Critical Care Specialist, Neonatal/Pediatric Specialist, Sleep Disorders Specialist, and Asthma Educator Specialist (NBRC, 2023). Candidates who successfully achieve a passing score on any of the specialty examinations will be awarded a credential for that specific area of practice. The

pulmonary function technologist examination consists of 115 multiple-choice items, with 15 pretest items and 100 scored items (NBRC, 2023). The examination has a two-hour completion limit, focusing on specific areas of instrumentation and equipment, procedures, and data management. Candidates who achieve a high cut score will be awarded the credential of Registered Pulmonary Function Technologist (RPFT). Candidates who achieve a low cut score will be awarded the credential of Certified Pulmonary Function Technologist (CPFT).

The Adult Critical Care Specialty (ACCS) examination consists of 170 multiple-choice items, including 20 pretest items and 150 scored items (NBRC, 2023). The examination has a four-hour completion limit, focusing on specific areas of respiratory critical care and general critical care. To become a candidate for the ACCS examination, individuals must have held the credential of RRT for at least one year (NBRC, 2023). The Neonatal/Pediatric Specialty (NPS) examination consists of 140 multiple-choice questions, including 20 pretest questions and 120 scored questions. The examination has a completion limit of three hours, with a focus on the specific areas of competencies shared between critical and general care and competencies specific to critical care. To become a candidate for the NPS examination, individuals must hold the credential of RRT (NBRC, 2023).

The Sleep Disorders Specialty (SDS) examination consists of 180 multiple-choice items, including 20 pretest items and 160 scored items. The examination has a completion limit of four hours with a focus on the specific areas of pre-testing, sleep disorders testing, study analysis, administrative functions, and treatment plans. To become a candidate for the SDS examination, individuals must have met one of three conditions: hold the credential of CRT or RRT with the completion of an accredited respiratory care program approved by CoARC that incorporated a

sleep track, or have held the credential of CRT for a minimum of six months before applying, or have held the credential of RRT for a minimum of three months before applying (NBRC, 2023).

The Asthma Educator Specialist (AE-C) examination consists of 175 multiple-choice items, including 25 pretest items and 150 scored items. The examination has a completion limit of 3.5 hours, focusing on specific areas of the asthma condition, assessing an individual with asthma and their family, asthma management, and organizational issues (NBRC, 2023). To become a candidate for the AE-C examination, one of two conditions must be met: an individual must hold the credential of CRT or RRT, or be a qualifying medical professional who holds a license or credential in their area of practice. The second condition that can be met is having at least 1,000 hours of direct education relating to asthma (NBRC, 2023).

Respiratory Therapy Profession

Respiratory therapy was established as a profession in 1943 due to the demand indicated by physicians within the United States (Shevade et al., 2021). Since then, the profession has flourished in the country, with approximately 191,457 registered respiratory therapists in the United States (Shaw & Benavente, 2020). However, there has been a recent issue of respiratory therapist shortage in the country, as enrollment in respiratory therapy programs has decreased by 7% from 2015 to 2017 (Danzy et al., 2022). Danzy et al.'s (2022) study focused on the respiratory care profession and its staffing needs within Louisiana, and half of their 118 respondents reported understaffing in their workplace. Shaw and Benavente (2020) noted that the credentials maintenance program implemented by the National Board of Respiratory Care (NBRC) in 2002 had been a point of concern during that time. While respiratory therapists received lifetime credentials before 2002, they are now required to be recertified every five years (Shaw & Benavente, 2020). Although this may have been an issue back then, 83% of

respondents in Shaw and Benavente's (2020) nationwide study were able to maintain their credentials. Other possible factors that might affect such shortages have been explored in the literature (Danzy et al., 2022; Shaw & Benavente, 2020; Yan et al., 2021).

One important factor that may influence the respiratory therapist shortage is salary (Danzy et al., 2022; Shaw & Benavente, 2020; Spirczak et al., 2022). Salary was found to be a significant factor for compassion satisfaction, which may then promote retention (Spirczak et al., 2022). Notably, Danzy et al. (2022) stated that respiratory therapists were among the allied health professionals with the lowest salaries. They reported a median income of USD 62,810 for respiratory therapists in the United States, which was lower than that of other similar healthcare professionals (Danzy et al., 2022). In Shaw and Benavente's (2020) report based on AARC members, hospital directors, and educational institutions, the mean wage of participant respiratory therapists was USD 33.56 per hour. Although participants were generally satisfied with their jobs, with only 17% giving low satisfaction ratings, it is important to note that compensation and benefits were the most frequently cited factors for satisfaction (Shaw & Benavente, 2020). Ensuring that respiratory therapists are fairly compensated may be necessary to support this practice and encourage more individuals to pursue this career.

As with other healthcare professionals, respiratory therapists may experience mental health issues that may prevent them from continuing their careers (Yan et al., 2021). Respiratory therapists may often experience fatigue and isolation in addition to other job-related stressors, which may lead to poor mental and physical health (Yan et al., 2021). Burnout was especially prevalent in the literature regarding respiratory therapists and respiratory therapy students (Asiri et al., 2023; Siraj et al., 2022; Spirczak et al., 2022). Survey data from 218 AARC members in the United States during the COVID-19 pandemic revealed moderate levels of burnout and

traumatic stress (Spirczak et al., 2022). Similarly, respiratory therapists in Saudi Arabia had high levels of emotional exhaustion and moderate levels of depersonalization (Asiri et al., 2023). A notable difference between these two studies is that Asiri et al. (2023) reported a moderate level of participants' lack of personal accomplishment, while Spirczak et al. (2022) reported a moderate to high level of compassion satisfaction. Although these two variables are not exactly synonymous, they may both determine the level of engagement respiratory therapists may have with their work. The evidence of moderate to high levels of personal accomplishment and compassion satisfaction found in Asiri et al.'s and Spirczak et al.'s studies showed that, while burnout may be a detrimental factor in respiratory therapy work, some respiratory therapists may find motivation and a sense of fulfillment in what they do despite the challenges they face.

Respiratory students were not exempt from experiencing burnout, as Siraj et al. (2022) found significantly increasing levels of depersonalization, emotional exhaustion, and burnout as students progressed in their studies. Siraj et al. attributed these results to the increasing amount of clinical exposure students encountered as they advanced in academic levels. Respiratory therapy interns who have experienced six months or more of clinical training displayed high levels of depersonalization, emotional exhaustion, and burnout, with low levels of personal accomplishment (Siraj et al., 2022). The risk of burnout in respiratory therapists appears to decrease with age once they enter into practice (Spirczak et al., 2022). In particular, Spirczak et al. indicated that respiratory therapists below 34 years of age displayed significantly higher levels of burnout compared to those within the 35-54 years age range. The authors purported that more clinical experience allowed respiratory therapists to build greater resilience and develop coping strategies to reduce burnout (Spirczak et al., 2022). These findings seem to imply that respiratory students may be more at risk of burnout as they are exposed to more clinical cases,

but that the risk decreases at a certain point in their practice once they become more accustomed to clinical practice. Although clinical exposure is important for preparation, it may be vital to ensure that the skills and procedures used for clinical practice are first embedded into students' memory through simulation or other learning strategies so that retrieving such skills would require less effort and therefore, cause less burnout during clinical exposure.

Other factors that may influence respiratory therapists' burnout include being assigned to critical care, poor collaboration and motivation from their organization, and work hours (Asiri et al., 2023; Spirczak et al., 2022). Simulation training on critical care may be necessary to prepare respiratory therapy students for the possibility of such assignments (Asiri et al., 2023). Yan et al. (2021) reported a significant and negative relationship between weekly work hours and mental health. In their study of respiratory therapists in Taiwan, they found better mental health results when respiratory therapists worked 40 hours per week compared to the previous policy of 46 hours per week (Yan et al., 2021). According to both Spirczak et al. (2022) and Asiri et al. (2023), the typical shift of respiratory therapists in the United States and Saudi Arabia lasted 12 hours, which could contribute to the moderate to high levels of burnout. With the shortage of respiratory therapists, it may be difficult to implement optimal work hours. However, policymakers should consider that more work hours may lead to even fewer respiratory therapists. Considering this prevalent problem, it may be helpful to include mental health and resilience training in respiratory therapists' preparation programs.

Roles of Respiratory Therapists

Respiratory therapists may hold various roles and perform numerous duties that are required for patient diagnosis and treatment. Job responsibilities may vary according to the environment (Algarni et al., 2023). In a clinical setting, such as a hospital, duties may include

patient evaluation for cardiopulmonary and breathing disorders, diagnostic testing, arterial blood sampling, the use of medical equipment, collaboration with medical staff, monitoring patient progress, and conducting patient and family education (Department of Labor, 2023). A respiratory therapist's role in a long-term facility, such as a nursing home, is to provide various services, which include pulmonary rehabilitation, oxygen therapy, management of inhalation medication, and management of ventilators (AARC, 2023). Respiratory therapists may also hold positions as educators, department managers, and researchers.

Across different countries, the majority of respiratory therapists often work in acute or critical care (Danzy et al., 2022; Shaw & Benavente, 2020; Shevade et al., 2021; Ward et al., 2022). Viewing the development of respiratory therapists' roles, Shaw and Benavente (2021) noted that respiratory therapists in the United States spent more time in adult intensive care in 2020 compared to 2014 and less time in the general medical and surgical units. Danzy et al. (2022), whose study was limited to Louisiana, indicated that research was the least reported role of the respiratory therapist. Other settings of respiratory therapy practice in the U.S. and Canada included outpatient facilities, clinics, physicians' offices, home health care, non-profit organizations, registries, and manufacturing or distribution companies (Shaw & Benavente, 2020; Ward et al., 2022). Although there is not much data on how these roles and settings differ for respiratory therapists, it is vital to note that aspiring respiratory therapists can have various options for practice other than the typical acute or critical care.

Respiratory therapists work with various cases and diseases, including but not limited to asthma, pneumonia, acute respiratory distress syndrome (ARDS), and chronic obstructive pulmonary disease (COPD) (Shevade et al., 2021). In terms of competencies, respiratory therapists mostly perform oxygenation, ventilation, infection control, and airway management

(Shevade et al., 2021; Yan et al., 2021). Based on Shevade et al.'s (2021) survey of 237 Indian respiratory therapists, the least performed competencies included diagnostic procedure recommendation, use of evidence-based principles, patient and family education, home care, administration, and pulmonary rehabilitation (Shevade et al., 2021). Preparation program designers should take note of these competencies to help prepare respiratory students for what they would most likely perform in practice.

Because COVID-19 largely involves cardiopulmonary and respiratory symptoms, respiratory therapists played a major role during the pandemic (Rajan et al., 2021; Shaw & Benavente, 2020; Ward et al., 2022). In India, most COVID-19 cases advanced to pneumonia, acute respiratory distress syndrome (ARDS), and sepsis, therefore requiring the expertise of respiratory therapists for oxygen support or mechanical ventilation (Rajan et al., 2021). Unfortunately, due to the shortage of respiratory therapists in India, many non-COVID-19 patients were unable to receive specialized care from respiratory therapists (Shevade et al., 2022). In the United States, approximately 5% of registered respiratory therapists also reported moving their practice to a COVID-19 hotspot, particularly in New York, California, and Texas (Shaw & Benavente, 2020). Respiratory therapists in Canada were also reassigned due to the COVID-19 pandemic (Ward et al., 2022). Up to 36.23% of Ward et al.'s (2022) respondents experienced increased or modified work hours, and 17.97% had their leave of absence denied or revoked during the pandemic. The sudden demand for respiratory care during the COVID-19 pandemic highlighted the need to prepare more respiratory therapists for practice.

Skills Expected from Respiratory Therapists

Respiratory therapists are expected to be equipped with multiple technical skills and strategic expertise (Dubois et al., 2021). According to respiratory care leaders in Canada,

respiratory therapists must be equipped with technical skills to handle complex or critical cases, as well as strategic expertise in various areas such as pulmonary rehabilitation, self-management weaning protocols, and respiratory disease pathways (Dubois et al., 2021). Some respiratory therapists are also equipped with specialized skills (Dubois et al., 2021), such as lung ultrasound (Liu et al., 2022; Mathew et al., 2023), prone position ventilation (Poor et al., 2020), and non-invasive ventilation (Jackson et al., 2022).

Point-of-care ultrasound (POCUS) has been utilized for assessing various cardiopulmonary diseases (Blair et al., 2022). The use of POCUS was especially vital during the COVID-19 pandemic as it allowed for higher accuracy in predicting COVID-19 trajectory and the need for respiratory support compared to other frequently used respiratory rate and oxygen saturation variables (Blair et al., 2022). Blair et al. (2022) noted the importance of standardized protocols for lung ultrasound that could be followed by allied healthcare professionals, such as respiratory therapists, to reduce the risk of bias associated with direct care of medical professionals. Having more trained respiratory therapists in lung ultrasound was purported to enhance access to care, collaboration, resource utilization, and patient satisfaction (Mathew et al., 2023). Unfortunately, lung ultrasound is not included in the foundational standard procedures of respiratory therapists around the world (Mathew et al., 2023). In Liu et al.'s (2022) study involving 494 respiratory therapists across China, only 22.7% of participants reported frequently or sometimes utilizing lung ultrasound, while 43.5% reported rarely utilizing it. Participants cited a lack of proficiency as the main reason for not utilizing lung ultrasound (Liu et al., 2022), which highlights the need for more specialized preparation and education for respiratory therapists.

A skill more frequently associated with respiratory therapists is ventilation (Jackson et al., 2022; Poor et al., 2020). Non-invasive ventilation (NIV) was cited as a valuable respiratory

care method, especially in low-resource areas (Jackson et al., 2022) or during times of crises that exhaust resources, such as the COVID-19 pandemic (Forrest et al., 2021). It was cited as a standard of care for COPD with hypercapnia or acute pulmonary edema caused by congestive heart failure (Jackson et al., 2022). In a retrospective multi-center study of respiratory interventions used for hypoxemic patients in New York during the COVID-19 pandemic, NIV was related to significantly lower risk of mortality than mechanical ventilation (Forrest et al., 2021). Applying prone position ventilation (PPV) was also cited as a valuable skill for respiratory therapists, as it enhances the survival of patients with ARDS (Poor et al., 2020). Respiratory therapists may benefit from learning NIV and PPV in addition to the basic skills.

Critical thinking and communication skills were also cited in the literature as vital skills for respiratory therapists (Alhamad & Zipp, 2021; Ogrodnick et al., 2020). Critical thinking was the most frequently cited skill for respiratory therapists, according to respiratory therapy leaders across different settings (Miller et al., 2023). Furthermore, the AARC has recommended respiratory therapy educational programs to promote critical thinking in their students in preparation for the complex challenges they may encounter in their future practice (Alhamad & Zipp, 2021). Communication skills may further help respiratory therapists in their practice as they may be tasked to educate patients with low health literacy (Ogrodnick et al., 2020). However, Ogrodnick et al. (2020) noted that respiratory care education curricula do not often include communication skills. As respiratory therapy students learn various technical skills, it is also imperative that they develop such soft skills to prepare them for practice.

The literature reviewed within this topic revealed the challenges, roles, expected skills, and competencies of respiratory therapists in practice. Based on the literature, it may be helpful to prepare respiratory therapists for dealing with burnout (Asiri et al., 2023; Siraj et al., 2022;

Spirczak et al., 2022), working in acute or critical care (Shaw & Benavente, 2020; Shevade et al., 2021), competencies such as oxygenation, ventilation, infection control, and airway management (Shevade et al., 2021; Yan et al., 2021), specialized skills such as lung ultrasound (Blair et al., 2022; Liu et al., 2022; Mathew et al., 2023), prone position ventilation (Poor et al., 2020), and non-invasive ventilation (Forrest et al., 2021., Jackson et al., 2022), critical thinking (Alhamad & Zipp, 2021; Miller et al., 2023), and communication skills (Ogrodnick et al., 2020). Respiratory education, which is discussed in the following section, is necessary for such preparations.

Respiratory Education

Respiratory care education can vary across and within countries Almeshari et al., 2022; Aumiller, 2021; Danzy et al., 2022; Sajnic et al., 2022; Sreedharan et al., 2022). In Sajnic et al.'s (2022) global study of respiratory care education, respiratory nursing experts across 25 countries recognized the disparities between countries in terms of existing nursing education programs, with approximately half of the participants stating that specialized respiratory care was included in their country's curriculum. Furthermore, there were notable discrepancies in course content, requirements for clinical exposure, and assessment (Sajnic et al., 2022). However, a key point in all respiratory education is a focus on preparing students for cardiovascular and pulmonary issues and disorders (Al Khathlan et al., 2022).

A notable difference between and within countries is the degree offered for and held by respiratory therapists. Danzy et al. (2022), whose survey was focused on Louisiana, found that most respiratory therapists (37.1%) held a bachelor's degree, closely followed by those holding an associate degree (35.5%). However, in Shaw and Benavente's (2020) nationwide report, a larger discrepancy was noted, with 82% of registered respiratory therapists holding an associate degree and 17% holding a bachelor's degree. Findings from other countries also differed, with

95% of 904 Indian respiratory therapists holding a bachelor's degree, over 2% holding an associate degree (Sreedharan et al., 2022), and 81.2% of 494 Chinese respiratory therapists holding a bachelor's degree (Liu et al., 2022). In Saudi Arabian institutions offering respiratory education, only one out of 13 institutions offered an associate degree, while 12 offered bachelor's degrees, and none offered a master's degree (Almeshari et al., 2022). The discrepancies in degrees held and offered highlight the still unclear standards for respiratory therapy education and practice around the world.

Although the AARC recommended advancing respiratory therapy standards by promoting bachelor's degrees over associate degrees and by developing a master's degree (Showalter et al., 2021), survey results from 58 hiring managers and directors in Pennsylvania indicated that no manager or director preferred a bachelor's degree holder over an associate degree holder (Aumiller, 2021). Even managers and directors with master's degrees preferred hiring those with an associate's degree. The survey respondents believed that both associate degree holders and baccalaureate degree holders possessed the AARC's 69 necessary competencies for respiratory therapists (Aumiller, 2021). Alternatively, Almeshari et al. (2022) noted that higher education, particularly postgraduate degrees, has been more helpful for respiratory therapists in terms of publications and teaching. More refinement appears to be necessary to determine the appropriate educational level for respiratory therapists, depending on their goals.

In terms of predictors for degree completion, Kinkle (2020) has identified various behavioral, personal, and environmental factors that were related to completing an associate degree in respiratory therapy. Significant behavioral factors were focused on the students' grades in program courses but not in general education courses (Kinkle, 2020). Significant personal

factors included gender, ethnicity, and age. In particular, female students, students aged 25 to 29 years at admission, and White non-Hispanic students were about twice as likely to complete their degrees as students of other demographics. Significant environmental factors included the advising model and the campus attended. Students who were advised by a professional advisor were about twice as likely to complete their degrees as those who were advised by faculty members (Kinkle, 2020). Respiratory therapists in the United States with an associate degree who pursued a bachelor's degree during the COVID-19 pandemic cited various factors that helped motivate them in their pursuit of education, including being determined to accomplish individual goals, receiving support from acquaintances, relatives, associates, opportunities presented by having a flexible work schedule, and a general adoration for learning (McHenry et al., 2023). In another study conducted in Texas, Showalter et al. (2021) investigated the factors affecting undergraduate respiratory therapy students' decision to pursue a master's degree. Self-efficacy was identified as a factor that influenced such a decision, with many students believing that their undergraduate program prepared them enough for graduate school, that they would succeed in graduate school, and that they had so far succeeded in their undergraduate courses (Showalter et al., 2021). However, most students agreed that a master's degree would provide greater career opportunities, but only 11.5% believe that a master's degree is necessary for their preferred occupations (Showalter et al., 2021). The factors above represent vital considerations for preparing respiratory therapy students for their desired careers.

Specialized Training for Respiratory Education

In line with the skills and competencies expected of respiratory therapists discussed in the previous subtopic, specialized training for respiratory care has been explored in the literature. For communication skills, Ogrodnick et al. (2020) investigated a respiratory therapy course

focusing on the teach-back method, wherein patients restate medical instructions in their own words to ensure their understanding. The course involved didactic lectures, videos, and discussions regarding health literacy, communication, and the teach-back method (Ogrodnick et al., 2020). Participants were assessed at a simulation center with standardized patients. Results revealed improvements in participants' knowledge and beliefs regarding health literacy and communication (Ogrodnick et al., 2020). Although communication skills are not frequently included in respiratory education, program designers may look into the teach-back method to help prepare respiratory therapy students for patient education in their future practice.

Ultrasonography is a more technical, specialized skill that is offered for respiratory therapy students. Based on Kappel et al.'s (2022) scoping review of seven articles regarding POCUS, ultrasonography educational interventions appeared to have multiple beneficial effects, such as reduced orders for thoracic x-rays, improvements in arterial line placements, and enhanced comfort or independence in image acquisition. Most programs from the seven studies involved didactic sessions for basic knowledge and supervised hands-on sessions (Kappel et al., 2022). Mathew et al.'s (2023) quasi-experiment focused on a two-day lung ultrasound training for respiratory therapists in India. The topics of the training included ultrasound physics, knobology, modes, probes, sono-anatomy of lungs, positioning, and image interpretation (Mathew et al., 2023). The training also included a practical module for machine acquaintance. Participants significantly improved in terms of both knowledge and competency, being able to differentiate pneumothorax, pneumonia, pleural effusion, and pulmonary edema with the LUS and to correctly perform lung ultrasound on their first try. These findings demonstrated that even a short two-day training may help improve lung ultrasound skills (Mathew et al., 2023). Despite the perceived importance of lung ultrasound in respiratory care, many respiratory therapists in

China did not receive training on this procedure, which led them to limit its use in their practice (Liu et al., 2022). These findings highlight the value of training and education for ultrasonography, particularly lung ultrasound.

Previous researchers have also explored training and education for ventilation (Jackson et al., 2022; Montanaro, 2021; Poor et al., 2020). For NIV, a three-day training involving didactic sessions, simulations, and team-based activities was found to be successful in significantly increasing participants' confidence (77%) and NIV knowledge (97.2%) (Jackson et al., 2022). The improvement in knowledge was significant across all domains, including general NIV uses (highest improvement), modes of NIV (lowest improvement), expanded NIV uses, practical applications of NIV, and physiology of NIV. Despite the limited sample size and training duration, the results of this study show promise for the specialized NIV training for respiratory therapists (Jackson et al., 2022).

Two sets of authors examined PPV training for interprofessional teams, including respiratory therapists (Montanaro, 2021; Poor et al., 2020). The PPV training examined by Poor et al. (2020) involved 12 sessions of didactic lectures, simulations with volunteer patients of various body types, simulations of emergency situations, and structured debriefing held in New York. A total of 73 healthcare providers with minimal prior experience with PPV completed the training, with 37 nurses, 18 respiratory therapists, and 18 physicians (Poor et al., 2020). Participants' perceived benefits of PPV for ARDS increased after training. They also felt more comfortable caring for prone patients and managing cardiac arrests in prone patients. Notably, even before training, 70% of respiratory therapists already perceived PPV to be beneficial for ARDS and were already comfortable managing prone patients (Poor et al., 2020).

Contrary to Poor et al.'s (2020) findings, respiratory therapists in Montanaro's (2021) study, which also took place in New York, showed lower levels of knowledge and perceived benefits of PPV for ARDS compared to physicians and nurses. The training in Montanaro's study involved a high-fidelity mannequin in an in-situ simulation, conducted in cycles with brief feedback until mastery. Participant teams comprised a critical care physician, six nurses, and two respiratory therapists, for a total of 46 participants (Montanaro, 2021). After the training, participants showed no significant changes in terms of medical knowledge. However, confidence levels significantly improved, and the participants generally performed well in actual cases that required prone positioning after the training (Montanaro, 2021). The discrepancies between the two studies' results may have been affected by the different simulation patients, the difference in sample size, or personal differences at baseline. Nonetheless, both studies showed some benefits of simulation training for PPV.

With the major role of respiratory therapists during the COVID-19 pandemic, respiratory therapy students are expected to be properly trained and prepared for it (Baoum et al., 2023). However, 145 out of 187 (77.5%) respiratory therapy students in Saudi Arabia agreed that the pandemic had impeded their clinical practice, while 141 (75.4%) reported feeling less confident and less prepared for the next level due to practical sessions being canceled. Third-year student participants, who typically received foundational practical sessions prior to the pandemic, appeared to be the most affected group. The reported disruption of the COVID-19 pandemic, however, was not significantly related to students' confidence levels, preparedness for the next level, and how the pandemic influenced students' abilities to connect theoretical and clinical aspects (Baoum et al., 2023). Moreover, Rajan et al. (2021) reported that respiratory therapists in India were knowledgeable about COVID-19, with 62% of their 68 respondents having good

knowledge and only 1.5% having poor knowledge. A majority (96%) of participants also had high levels of confidence in their respiratory care skills, particularly in terms of performing closed suction, setting up ventilators, and preparing and assisting in intubation (Rajan et al., 2021). Such evidence from other countries shows promise for respiratory education in preparing students for crises such as the COVID-19 pandemic.

Modalities Used in Respiratory Education

Aside from the content, previous researchers have also explored the unique modalities used in respiratory education. For instance, Alhamad and Agha (2023) investigated the knowledge and retention outcomes of mobile learning or m-learning. The m-learning course involved the AGB Book app for theoretical knowledge and the Arterial Blood Gas (Lite) app for interactive sessions (Alhamad & Agha, 2023). Based on data from 45 third-year respiratory therapy students in Saudi Arabia, both traditional learning methods and m-learning were related to improvements in knowledge acquisition and retention, making both of them viable options for respiratory education (Alhamad & Agha, 2023). AbuNurah et al. (2020) focused on international education. The authors surveyed 62 respiratory students from Saudi Arabia who had studied in the United States (AbuNurah et al., 2020). Based on the results, personal and professional development, as well as global understanding, were ranked highest in terms of the benefits of international education, while intellectual development was ranked lowest. This low ranking was attributed to possible language barriers. The program duration positively influenced participants' perceptions regarding personal and overall development, as well as respiratory therapy roles (AbuNurah et al., 2020). Because respiratory therapy originated in the United States, there appears to be no evidence for international respiratory education from American students to

other countries. Nonetheless, this option warrants further exploration in line with globalization and international collaboration.

As a skills-based occupation, hands-on practice is vital for the respiratory therapy profession (Shevade et al., 2022). Unfortunately, the use of simulations in respiratory education across the United States is still limited, lacking standardization, structured debriefing methods, and faculty development (Davis et al., 2022). Debriefing has been cited as a helpful way to process information. It allows the learner to recount and assess their experiences, accomplishments, and areas for improvement during the practice sessions (Davis et al., 2022; Mathur, 2020). In line with the information processing theory, debriefing may serve as a step for selection perception in which learners select which parts of their experience they should retain in their memory (Sanongdej et al., 2021).

In Mathur's (2020) qualitative study involving respiratory therapist training for advanced cardiac life support, participants emphasized the importance of debriefing for processing what they did in training and what still needs to be improved. Out of the 124 respiratory education programs examined by Davis et al. (2022), 81% used simulations with varying lengths of scenarios, and only 33% provided structured debriefing. Similarly, ten (76.92%) out of 13 institutions in Saudi Arabia offering respiratory education utilized clinical simulations (Almeshari et al., 2022). There were no details regarding debriefing in the Saudi Arabian study. However, Almeshari et al. (2022) did note the various types of laboratories used in respiratory education, including those for patient assessment, simulation, mechanical ventilation, pulmonary function, sleep disorders, pulmonary rehabilitation, and cardiopulmonary function.

Faculty Role in Respiratory Education

The role of faculty is especially important in developing respiratory care students' needs (Aldhahir et al., 2020; Alhamad & Zipp, 2021). Faculty acted as guides, facilitators, and role models to respiratory therapy students and were purported to help develop the students' critical thinking skills through these roles and through developing and implementing active learning strategies (Alhamad & Zipp, 2021). Support from faculty was cited as a motivating factor for pursuing further education in the midst of the COVID-19 pandemic (McHenry et al., 2022). Respiratory therapy students from the United States in McHenry et al.'s (2022) qualitative study shared how the faculty were generally encouraging, giving heartfelt messages of support, being available and approachable, and providing flexibility in submitting requirements. To determine further ideal characteristics of respiratory therapy faculty, Aldhahir et al. (2020) surveyed 34 respiratory therapy managers, directors, and supervisors from the southeastern United States. They found the participants valued professional competence most, followed by personal attributes and then relationship with students (Aldhahir et al., 2020). Participants lauded respiratory therapy faculty who exemplified skills, values, and attitudes that are mirrored by students, as well as showed genuine concern for patient care (Aldhahir et al., 2020).

Unfortunately, as with the shortage of respiratory therapists in general, faculty shortages also exist in the field (Almeshari et al., 2022). In Saudi Arabia, the average faculty-student ratio was reported to be 1:11, which was much higher than the reported 1:5 ratio in the United States (Almeshari et al., 2022). At the same time, faculty members in the United States were faced with the challenge of limited faculty development (Davis et al., 2022). In Davis et al.'s (2022) study, less than half (45%) of the 124 respiratory education programs included faculty training for simulations, and only 40% included faculty training for debriefing. Furthermore, only 28% of respondents were familiar with the International Nursing Association for Clinical Simulation and

Learning (INACSL) Standards of Best Practice: Simulation, which has served as a foundation for simulation-based training. Reasons for the lack of faculty development included lack of finances, time, and research regarding simulation-based training in respiratory education (Davis et al., 2022). Considering the important roles of faculty in developing future respiratory therapists, institutional leaders should look into faculty development strategies and opportunities.

Based on the evidence regarding respiratory education from different countries presented, various inconsistencies and gaps still exist that prevent evidence-based education. Therefore, a need for further studies to determine standardized training requirements, content, and strategies for respiratory education is vital (Mathew et al., 2023). Furthermore, despite the relatively high levels of knowledge and confidence reported by respiratory therapists in managing COVID-19 cases (Baoum et al., 2023; Rajan et al., 2021), there is contrary evidence showing the under-preparedness of respiratory therapists who graduated between 2020 and 2021, as most of them needed additional support for advanced therapies, patient recommendations, critical thinking, self-confidence, and time management (Varekojis et al., 2022). Further studies in respiratory education may help to advance this field in both theory and practice.

Instructional Methods for Medical Fields

As part of the medical field, respiratory therapists must be well-prepared to enter clinical practice. Career preparedness in the medical field requires attitudes, knowledge, competencies, and behaviors that can help the student to handle not just routine procedures but also unexpected events and changes at work (Alismail & Lopez, 2020; Marciniak et al., 2022). These elements constitute the competency-based educational framework that has been used since the 1900s (Alismail & Lopez, 2020). As such, it is vital to develop students' critical thinking, analytical, communication, psychomotor, and management skills to prepare them for clinical practice

(Culha, 2019). Addressing these skills in clinical instruction may require innovative instructional methods for students to engage them, especially the younger generation, who are more accustomed to multitasking (Culha, 2019). It is also important to align students' perceived benefits of training and education to ensure buy-in and cooperation (Poor et al., 2020). Earning the interest of students may improve information processing as they may pay more attention to stimuli, which they can commit into memory (Sanongdej et al., 2021).

Normally, clinical education reflects an apprenticeship approach wherein students are taught individually at the patient's bedside (Alismail & Lopez, 2020). Such an approach can provide clinical students with real-life experiences, which may translate into meaningful learning experiences to prepare them for their careers (Marciniak et al., 2022). The COVID-19 pandemic hindered such experiences due to the restrictions and shutdowns. However, many respiratory therapists wished to proceed with such clinical education despite the risk of infection (Baoum et al., 2023). Instructors and program designers, therefore, had to find ways to provide similar learning experiences for clinical students during the pandemic.

The rapid spread of COVID-19 and the urgent restrictions that followed have led to the quick adaptation of computer or web-based learning, also called e-learning or online learning (Hussein et al., 2021). Computer or web-based learning was defined as the provision of educational content via information and communication technologies. This can include several features, such as didactic lectures, games, simulations, and online forums (Hussein et al., 2021), as well as video, audio, and multimedia tools (Culha, 2019). More recently, education has also taken the form of mobile learning or m-learning, wherein the content is provided via mobile technologies (Alhamad & Agha, 2023). In a study in Saudi Arabia involving third-year respiratory therapy students, m-learning, particularly the ABG Book app and Arterial Blood Gas

(Lite) app, was found to be equally effective as traditional learning in terms of knowledge acquisition and retention. Students appeared to obtain theoretical knowledge through the ABG Book app, which they were able to connect, code, recall, and rehearse with the interactive functions of the Arterial Blood Gas (Lite) app. M-learning was, therefore, cited as a viable alternative to traditional learning that could increase student motivation and engagement due to its novelty, convenience, and interesting features (Alhamad & Agha, 2023).

Although computer-based learning has been utilized in remote or distance education for years, clinical instructors noted the importance of hands-on experiences and laboratory sessions where they could supervise students in developing their skills (Varekojis et al., 2011). Another issue with web-based learning, in particular, is the need for a stable internet connection, which students may not always have (Culha, 2019). Nonetheless, there have been studies reporting the success of computer and web-based learning in clinical education (Brown et al., 2022; Durmaz Edeer & Sarıkaya, 2018; Hussein et al., 2021). Results from Hussein et al.'s (2021) scoping review of 17 studies regarding computer-based education for healthcare professionals indicated that this type of instructional method was effective for improving knowledge, skills, and adherence to guidelines. Similar to m-learning, computer-based learning included interactive features that allowed students to process and rehearse information, which may have allowed for better memory retention. Based on Hussein et al.'s findings, computer-based learning may address the aforementioned necessary elements required for clinical education, which are knowledge, competencies, attitudes, and behaviors (Alismail & Lopez, 2020; Marciniak et al., 2022).

Both quantitative and qualitative evidence exist for computer or web-based learning (Brown et al., 2022; Durmaz Edeer & Sarıkaya, 2018). In Brown et al.'s (2022) quantitative

study comparing online synchronous education to traditional education for hospital employees in the United States, those in the online group gave higher ratings to their course compared to the traditional learning group. A majority (97%) of the employees in the online group further stated that the online medium served as an ideal training environment, and minimal technical issues were reported (Brown et al., 2022). Durmaz Edeer and Sarıkaya (2018) provided qualitative evidence for a computer-based training in their phenomenological study involving nursing students in Turkey. The nursing students mostly found the program to be effective in instilling deep and detailed knowledge (Durmaz Edeer & Sarıkaya, 2018). The demonstration videos were also cited to have improved students' self-confidence in their skills, highlighting the value of realistic visual stimuli for information processing. The students appreciated the reusability of the simulations in the program, allowing them to rehearse at any time, which is crucial for memory retention (Durmaz Edeer & Sarıkaya, 2018). Overall, the evidence in the literature points to the advantages and effectiveness of computer or web-based learning in the clinical setting. These results, however, were mostly based on self-reports and personal evaluations, which may not fully reflect the actual knowledge and skills outcome (Brown et al., 2022; Durmaz Edeer & Sarıkaya, 2018; Hussein et al., 2021).

Peer-assisted learning is another instructional method that has been explored in the field of medicine. It involves learning from more experienced or knowledgeable individuals who belong to the same social group as the learner (Bahar et al., 2022; Culha, 2019). A tenet of information processing theory is that educators should foster a learning environment that can motivate and engage learners (Loc et al., 2019). Peer educators may provide such environments more effectively as they share similar experiences with the learners. Culha (2019), who reviewed Turkish studies involving peer-assisted learning, noted that senior students have helped first-year

students improve their clinical skills, decrease their anxiety, and increase their internal locus of control. Bahar et al. (2022), whose semi-experimental study was also conducted in Turkey, found that peer-assisted learning was just as effective as traditional learning in improving nursing students' psychomotor skills of airway application and nasotracheal aspiration scores. Furthermore, students in the peer-assisted learning group showed significantly less post-test anxiety than the traditional learning group (Bahar et al., 2022). The authors attributed the decrease in anxiety to the absence of power imbalances and hierarchy in peer-assisted learning compared to the traditional setup (Bahar et al., 2022). Although it is not as frequently explored in the medical field as computer or web-based education, peer-assisted learning represents another possible alternative to traditional instructional methods that could also improve learners' attitudes and behaviors.

The final instructional method to be explored in this subtopic is the flipped classroom approach. The flipped classroom approach is a student-centric method that encourages self-directed learning (Bazrafkan et al., 2023; Culha, 2019). The process of flipped classrooms begins with the students learning the content individually by themselves through resources often provided by the program or institution (Culha, 2019). Afterward, the students gathered face-to-face online and performed activities that reinforced their learning, including case discussions, game simulations, and laboratory applications (Culha, 2019). Such reinforcement serves as a vital step in information processing as it allows the learner to recall, apply, and rehearse the information stored within their memory (Loc et al., 2019). Bazrafkan et al. (2023) conducted a quasi-experimental study in Iran to determine the efficacy of a flipped classroom approach on nurses' motivation and knowledge of COVID-19 critical respiratory care. The nurses showed high levels of engagement and cooperation during the training, as well as significant

improvements in terms of knowledge and motivation after the training (Bazrafkan et al., 2023). It appears that the flipped classroom method may also be helpful in improving learners' knowledge, skills, attitudes, and behavior toward clinical practice.

The instructional methods discussed in this subtopic represented viable alternatives to traditional instructional models that could help prepare clinical students for practice by improving not only their knowledge and skills but also their attitudes and behaviors. Computer or web-based learning may be especially helpful during situations such as the COVID-19 pandemic, when face-to-face learning was not allowed. Notably, peer-assisted learning and the flipped classroom approach may also be adapted online. However, the existing studies only presented evidence for face-to-face versions. Simulations are also among the instructional methods considered, not just for clinical education but for various fields that require practical competencies. The amount of evidence for this particular instructional method warrants a thorough exploration, which will be provided in the following subtopic.

Use of Simulation in Clinical Education and Preparation

Simulations are artificial environments or settings based on real-life situations and processes (Kang et al., 2022). Simulation-based training allows learners to immerse themselves within the artificial environment and learn through low-risk rehearsal and feedback (Kang et al., 2022). Simulations and simulation-based training are being explored as alternatives to clinical exposure due to their capacity for practical skill development within a controlled environment (Kang et al., 2022; Al Khathlan et al., 2022; Roberts et al., 2019). Unlike real-world scenarios, simulations are repeatable and modifiable, allowing learners to continuously practice specific skills (Roberts et al., 2019). Both Al Khathlan et al. (2022) and Roberts et al. (2019) presented evidence in their respective studies showing no significant differences between the effects of

simulation-based training and clinical exposure on student outcomes. This section of the review covers the use of simulation in clinical education and preparation, its advantages, disadvantages, and different forms.

Forms of Simulation-based Education

Simulation-based education can come in many forms, including in situ simulation (Hazwani et al., 2021; Montanaro, 2021), task trainer devices, computer-based simulations (Davis et al., 2022; Kang et al., 2022), or virtual reality simulations (Nassar et al., 2021). Situ simulations involve training scenarios that are conducted in the actual setting where it is typically performed in practice, using real-life equipment and resources (Goldshtein et al., 2020; Hazwani et al., 2021; Montanaro, 2021). This form is especially relevant for training members of an institution, such as hospitals or clinics, and for preparing them for medical emergencies (Goldshtein et al., 2020). The realism provided by the actual environment may be the biggest advantage offered in situ simulation training, as it adheres to the principle of information processing theory, indicating that similarity in the learning environment improves memory retrieval (Krishnamoorthy et al., 2021).

Within the literature, in situ simulations have been successfully used to identify challenges and gaps in medical practices, systems, and workflow (Hazwani et al., 2021; Montanaro, 2021). A systematic review of studies involving in situ simulations for healthcare providers further exhibited the effectiveness of in situ simulations for improving hospital mortality and morbidity rates (Goldshtein et al., 2020). The major challenge with in situ simulations, as noted in Hazwani et al.'s (2021) study, was the scarcity of resources that should be allotted for actual practice rather than the simulations. While in situ simulation may indeed seem wasteful in terms of resource use, institutions can save in terms of not needing an

additional environment dedicated to the training (Goldshtein et al., 2020). As such, in situ simulations continue to be considered in clinical education and preparation for practice.

The fidelity of simulation training may also vary in terms of the patient. Task trainer devices are low-fidelity devices modeled after the human anatomy that can be used to practice specific skills such as injection or insertion of catheters (Davis et al., 2022; Kang et al., 2022). Full-body mannequins that perform realistic physiological reactions also exist to provide high-fidelity simulations for clinical students (Cura et al., 2020). In some cases, a standardized patient or an actual person playing the role of a patient is utilized to provide even higher fidelity (Davis et al., 2022; Kang et al., 2022). Standardized patients are not often used to add the factors of safety standards and interpersonal skills to learners (Kang et al., 2022). These different forms of simulation each have their own unique features that can be advantageous or disadvantageous depending on the learners' needs and goals.

Different forms of simulations continue to be used in clinical education (Nye et al., 2019). Based on a survey of 130 program directors and educators of advanced practice nursing in the United States, a majority (68%) of the programs included standardized patient simulation, 47% used mannequins, and 36% used task trainers (Nye et al., 2019). Outcomes also varied according to the form of simulation used. A randomized controlled experimental study involving undergraduate students taking up internal medicine nursing in Turkey was conducted to compare task trainers, mannequins, and standardized patients in terms of respiratory system assessment knowledge, skills, stress levels, and self-confidence (Cura et al., 2020). Results from 139 students indicated that all three forms led to increased knowledge. Stress levels were significantly higher and skill outcomes lower for the standardized patient group, which suggested that the students may not have been ready for such high-fidelity simulations. Although such

realism may be beneficial for memory retrieval, the high level and number of stimuli may be overwhelming and may have caused cognitive overload (Ladendorf et al., 2019). Self-confidence was lower for the task trainer group, which may be reflective of the low level of fidelity, leaving students underprepared for real-life situations (Cura et al., 2020). Based on this evidence, high-fidelity mannequins that provide a moderate level of realism while maintaining just enough stimuli to prevent cognitive overload may be more effective for assessments.

With the advancement of technology, a relatively newer form of simulation has been utilized in education (Davis et al., 2022). Computer-based or virtual simulations involve computer-generated scenarios that model reality but only involve computer-based inputs and outputs. Computer-based simulations may also take the subform of virtual task trainers, virtual patients, or the more advanced immersive VR simulation (Davis et al., 2022). In the VR subform, learners are immersed in a virtual environment in which they can explore and interact with (Nassar et al., 2021). The advantages of VR include the possibility of auto feedback features, its upgradeability, the use of a single system for multiple procedures, and the way it does not require actual resources (Nassar et al., 2021).

In a review of studies involving desktop and immersive VR simulation trainings for registered nursing students, Shorey and Ng (2021) found significant improvements in six out of 11 studies involving theoretical knowledge, compared to four out of 13 studies involving clinical skills and one out of seven studies involving affective outcomes (Shorey & Ng, 2021). Notably, there was no evidence in any of the studies reviewed that VR led to worse outcomes compared to traditional methods. These results suggest that VR may be more helpful in improving knowledge compared to skills, which is surprising considering how VR may provide the right environment for information processing, application, and rehearsal. However, caution is warranted as some of

the studies dated back to 2012, when VR technology did not provide as much fidelity as newer technologies (Shorey & Ng, 2021). Considering the variety of simulation forms available and their unique features, program directors and educators should select the modality that would best suit the learning objectives, student needs, and goals (Kang et al., 2022).

Advantages and Disadvantages of Simulation-based Training

Several past researchers have highlighted the main benefit of simulation training as a way for learners to gain hands-on experience within a safe and structured environment (Blue et al., 2018; Culha, 2019; Ogrodnick et al., 2020; Nassar et al., 2021). In Blue et al.'s (2018) mixed methods study involving healthcare students in California, the students cited the setting of training as one of the most important features. They noted that simulation settings allowed them to feel safe as they learned and rehearsed new skills and techniques (Blue et al., 2018). This benefit was noted to be especially vital in high-risk fields of medicine, such as surgery (Nassar et al., 2021). In such fields, simulations are utilized to replicate high-risk and unusual scenarios that the learners may not be able to experience or handle in the real clinical setting. Learning the knowledge and skills from such realistic but safe scenarios would allow students to better retrieve them when necessary in their practice. Furthermore, scenarios within simulations are replicable, which allows students to rehearse such unusual and risky scenarios (Nassar et al., 2021).

Clinical students across studies have highlighted the need for such hands-on practice to hone their skills (Durmaz Edeer & Sarıkaya, 2018; Mathur, 2020; Ogrodnick et al., 2020). In Ogrodnick et al.'s (2020) mixed methods study, respiratory therapy students in the southeastern United States underwent health literacy training, learned the teach-back method, and were assessed at a simulation center. Although the students showed significant improvements in

knowledge, only 70% of the 20 students were able to apply the teach-back method in the assessment. The students who did not apply the teach-back method indicated a need for simulated rehearsals for hands-on learning rather than implementing the simulation only at the assessment stage (Ogrodnick et al., 2020). Simulated rehearsals present the opportunity for more sensory input, which enhances memory storage, as indicated in the information processing theory (Ladendorf et al., 2019). Providing a simulation training that is similar to the simulated assessment would also enhance memory retrieval during assessment, in accordance with the principles of information processing theory (Krishnamoorthy et al., 2021).

In another study, nursing students underwent computer-based training for pre-postoperative care, which included text, images, tables, flowcharts, videos, and sample cases (Durmaz Edeer & Sarikaya, 2018). Although the nursing students appreciated the reusability of the computer program, many expressed the need for hands-on experiences in a skill laboratory, stating that watching videos on-screen was not enough to learn certain practical skills (Durmaz Edeer & Sarikaya, 2018). Practicing nurses and respiratory therapists in Maryland also expressed the need for simulated rehearsals to develop their muscle memory and retain the skills needed for their recertification (Mathur, 2020). These findings highlight the main benefit of simulation-based training, which is the opportunity for hands-on experience and rehearsals.

Simulation-based training has also been cited to increase students' confidence and reduce their anxiety to perform clinical skills (Blue et al., 2018; Hazwani et al., 2021; Montanaro, 2021). Around 95% of the healthcare students in Blue et al.'s (2018) study reported an increase in their confidence in terms of applying the lessons to their future practice. It should be noted that Blue et al. did not provide many details regarding the fidelity of the simulation used in this study, and students' confidence levels for future practice may not accurately reflect their

confidence in the actual setting. In another study, physicians, nurses, and respiratory therapists underwent high-fidelity mannequin training for prone positioning (Montanaro, 2021). After the training, participants showed no significant changes in terms of medical knowledge. However, confidence levels significantly improved, and participants generally performed well in actual cases that required prone positioning after the training (Montanaro, 2021). A similar study was conducted by Hazwani et al. (2021), involving physicians, respiratory therapists, nursing staff, radiology technicians, and anesthesia technicians. In situ simulation training was implemented for the COVID-19 pandemic readiness of a pediatric tertiary hospital (Hazwani et al., 2021). In evaluating the training program, participants mostly shared that their confidence increased, and anxiety decreased, contributing to their readiness for the pandemic (Hazwani et al., 2021). These findings supported the general effectiveness of simulation-based training for improving learners' confidence.

Simulation training can improve not only individual competencies but also teamwork, communication, and systems performance (Blue et al., 2018; Hazwani et al., 2021; Kleib et al., 2021; Krielen et al., 2023; Pan & Rajwani, 2021; Poor et al., 2020). This was observed in Hazwani et al.'s (2021) and Pan and Rajwani's (2021) studies regarding COVID-19 readiness, wherein simulations revealed several issues with the systems and workflow, which then allowed hospital administrators to create action plans to address them. For instance, the role of gatekeeper was established as a solution for crowding and contamination issues identified during simulation runs (Pan & Rajwani, 2021). The simulation also highlighted the challenge of communicating through enclosed spaces during the pandemic, which was resolved through various creative means, such as the use of communication devices with predetermined signs (Pan & Rajwani, 2021). The interprofessional simulation in Kleib et al.'s (2021) study involving nursing and

respiratory therapy students in Canada also revealed the issue of knowledge and skill gaps between the students, which then led to the suggestion of both nursing-focused and respiratory therapy-focused orientations for all students. Within the safe environments of simulations, healthcare teams, including respiratory therapists, may identify needs and issues that can influence their preparedness for clinical practice.

Interprofessional or multidisciplinary simulations have been cited to improve team members' mutual understanding and, in turn, their cooperation and communication with each other (Kleib et al., 2021; Krielen et al., 2023; Poor et al., 2020). Through these simulations, students process and store information related not only to their own practice but to their surrounding teams as well, which adds another layer of realism that is vital for memory retrieval during actual clinical practice. Medical students and nursing students in the Netherlands participated in an interprofessional simulation training for acute care and indicated increased awareness of each other's competencies and thought processes, as well as the value of direct and responsive communication, which allowed them to work together better (Krielen et al., 2023). Similarly, nursing and respiratory therapy students in Kleib et al. (2021) shared that the simulations allowed them to understand and value each other's scopes of practice and how their roles complemented each other. Kleib et al. also noted the improved communication between the students, observing that they naturally talked about the cases even outside the time allotted for debriefing. Shared leadership was another outcome related to interprofessional simulation training, as nurses, respiratory therapists, and physicians exhibited improved collaboration and cohesion in prone position ventilation (Poor et al., 2020). On a different note, participants in Blue et al.'s (2018) study reportedly learned to value other religious, cultural, or social values, as well as discrepant patient care perspectives. The capacity to bring out differing perspectives and

raise awareness regarding roles and competencies, therefore, appears to be the most important benefit of interprofessional simulations.

Despite the advantages of simulations, previous authors have noted some disadvantages, particularly that it cannot serve as a standalone teaching method and must be accompanied by instruction (Blue et al., 2018; Davis et al., 2022; Ladendorf et al., 2019). In Blue et al. (2018), up to 97.8% of participants noted that the teaching methods used in alignment with the simulations were effective, and all participants valued the support of teaching materials. Ladendorf et al. (2019) noted that even the most high-fidelity immersive VR simulations could not serve as a standalone method for education. They proposed that educators must first provide appropriate content and engaging discussions to mentally prepare learners for the simulations (Ladendorf et al., 2019). This is supported by policy, as the Commission on Accreditation for Respiratory Care (CoARC) of the United States recommended using simulations as supplements to traditional clinical training but not as valid alternatives (Davis et al., 2022). It also aligns with the information processing theory's stages, in which the information must first be inputted into the learner's memory before proceeding with recall and rehearsal (Loc et al., 2019).

Previous authors have also noted gaps in the literature for simulation-based training that suggest the need for further development (Durmaz Edeer & Sarıkaya, 2018; Roberts et al., 2019). The lack of global standards for simulation-based education in the clinical field may be attributed to the lack of generalizability in studies, as well as the limited improvements to actual student outcomes, which brings into question whether simulation may indeed replace traditional clinical training (Roberts et al., 2019). At the same time, Durmaz Edeer & Sarıkaya (2018) indicated the need for further evidence to support the use of simulations for specific clinical conditions as well as its effect on the transition to practice. It appears that more research is needed to develop

simulation-based training for clinical education, particularly for specific fields such as respiratory therapy.

The various forms of simulations can be advantageous as educators can select from a wide range of options based on the level, needs, and goals of their students. The main advantage of simulation-based training was cited as the opportunity to practice and learn within a safe and structured environment (Blue et al., 2018; Culha, 2019; Nassar et al., 2021). Simulations have also been cited to increase students' confidence and reduce their anxiety to perform clinical skills (Blue et al., 2018; Hazwani et al., 2021; Montanaro, 2021). These features reflect the ideal learning environment for better information processing (Loc et al., 2019). The benefits of interprofessional simulations on improving systems, communication, and mutual understanding have also been cited in the literature (Blue et al., 2018; Hazwani et al., 2021; Kleib et al., 2021; Krielen et al., 2023; Pan & Rajwani, 2021; Poor et al., 2020). The main disadvantage of simulation-based training identified by previous authors was that it serves only as a supplement rather than an alternative to traditional clinical instruction methods (Blue et al., 2018; Davis et al., 2022; Ladendorf et al., 2019). The lack of global standards, as well as specificity for different clinical conditions, has also been cited as a disadvantage of simulation-based education (Durmaz Edeer & Sarıkaya, 2018; Roberts et al., 2019). Nonetheless, the many benefits and continuous developments of simulation-based training make it a promising tool for clinical education. To determine how simulation and other instructional methods may be utilized in respiratory care education, it is important to first explore the respiratory therapy profession itself, including its roles, tasks, and relevant skills.

Social Emotional Learning

Previous researchers have also explored the aspects of social-emotional learning in the medical field. Alshareef et al. (2024) expressed that students in the healthcare field are impacted by emotional stresses, which negatively influence their academic performance and can also have an effect on their interactions with the learning environment, influencing their overall progress. The authors found that managing emotions and having support systems are important for improving academic success (Alshareef et al., 2024). Alhosseini et al. (2025) found in their research that emotional intelligence training among nurses who worked in intensive care units produced a positive outcome with stress management for nurses, giving them awareness of their emotions and how to effectively handle them both in the work environment and their family life (Alhosseini et al., 2025). Critical thinking plays a crucial role in medical practice. However, this leads back to emotional intelligence. According to Machado et al. (2025), nurses with higher emotional intelligence have been shown to better manage emotional stress. Machado et al. (2025) found that an optimistic patient care relationship existed among nurses equipped with emotional intelligence skills, leading to improved medical practices and patient outcomes (Machado et al., 2025). Emotional intelligence is important for health science students to succeed in their studies. Research by Falade et al. (2025) shows that students with high emotional intelligence, who are self-aware, empathetic, and good at relating to others, tend to perform better academically. The study also emphasizes the value of family support. Students who get encouragement and understanding from their families feel more motivated and resilient in their studies. This mix of emotional intelligence and family support helps create a positive learning environment, which leads to better educational outcomes for future health professionals (Falade et al., 2025).

Summary

This chapter provided a review of literature relevant to respiratory care education and practice. The theoretical framework for this study was the information processing theory (Miller, 1956), which can be helpful in explaining how respiratory therapy students process information and apply it in practice. Various instructional methods have been explored in the literature to prepare students for clinical practice (Alismail & Lopez, 2020; Brown et al., 2022; Culha, 2019; Durmaz Edeer & Sarikaya, 2018). Among these instructional methods, simulation was found to be advantageous for the clinical field due to its capacity for practical skill development in a safe, controlled, and replicable environment (Blue et al., 2018; Culha, 2019; Nassar et al., 2021). Simulation allows for an ideal learning environment, multiple stimuli for information processing and storing, and realism for memory retrieval (Krishnamoorthy et al., 2021; Ladendorf et al., 2019; Loc et al., 2019). However, gaps in the literature remain regarding global standards for simulation (Roberts et al., 2019) and its application in specific clinical conditions (Durmaz Edeer & Sarikaya, 2018). Furthermore, simulation was cited as a supplement rather than a standalone instructional method for clinical education (Blue et al., 2018; Davis et al., 2022; Ladendorf et al., 2019).

Respiratory therapists are among the professionals who can benefit from simulation, with their numerous roles, tasks, competencies, and specialized skills (Dubois et al., 2021; Mathew et al., 2023; Ogrodnick et al., 2020; Shevade et al., 2021). However, the use of simulation in respiratory education is still lacking (Davis et al., 2022). There is a notable dearth of qualitative research exploring this topic, with most studies focusing on prevalence rates and quantitative outcomes. As such, there is a need to further explore the topic of simulation in respiratory education and how it could possibly help early-career respiratory therapists in their practice. The

following chapter contains a discussion of the methodology for the present study that may help address the problem and the gaps in the literature.

Chapter 3: Research Method

Early-career respiratory therapists face various challenges as they enter into the work environment regarding skills that must be met for the needs of patients, family members, and medical staff (AARC, 2023). They are expected to enter the workforce early in their career with skills to build upon as they gain experience (Behr et al., 2022). Clinical simulation practices are a significant factor in influencing student success because hands-on training allows the advancement of needed skills (Davis et al., 2022; Khathlan et al., 2022; Ogrodnick et al., 2020; Terry & Ari, 2022; Violato, 2022). However, it is unknown how former students experience and perceive the transition from the academic setting through written and clinical simulation examinations when entering the workforce (Varekojis et al., 2022). There is a need to research and understand this topic because when early-career respiratory therapists enter the workplace, it is essential that they can effectively adapt, communicate, and perform the required duties while supporting the patient (Krielen et al., 2023).

The general problem to be addressed in this study is that early-career respiratory therapists are entering practice with insufficient preparation. The purpose of this qualitative case study is to examine the experiences and perspectives of early-career respiratory therapists regarding their transition from the academic setting through written and clinical simulation examinations and into the early years of practice. The open-ended research questions align with the problem, and the purpose statement addresses what is currently not known about how recent graduates experience the transition from their academic programs through written and clinical simulation examinations and into the early years of practice. A qualitative case study allowed a thorough investigation of respiratory therapists' experiences and perspectives (Hill et al., 2005; Yin, 2018) as they transition into their early careers. Hill et al. (2005), Im et al. (2023), and Yin

(2018) all agree that interviews, observations, and document analysis are suitable forms of data collection for a case study. These methods can be used to uncover the nuances of career preparedness (Im et al., 2023). Case study research recognizes that individual, organizational, and environmental factors influence career preparedness (Yin, 2018; Sreedharan et al., 2022). By focusing on particular contexts, the unique factors aiding the achievements and challenges of the transition from the educational setting to practice can be identified and provide individualized suggestions for improvement (Im et al., 2023). This section includes presentation of the research methodology, design, population, sample, materials, study procedures, data analysis, assumptions, limitations, delimitations, ethical assurances, and a chapter summary.

Research Methodology and Design

Qualitative research has a direct focus on the whole behavior, attempting to uncover the direct thoughts regarding the experiences, events, and occurrences that allow meanings to be determined (Lima & Newell-McLymont, 2021). Stake (2010) expressed qualitative research's epistemology, portraying it as existential (non-deterministic) and constructivist. Stake (2010) highlighted the intrinsic correlation between the two, rooted in the premise that phenomena are intricately interwoven with various contextual dimensions encompassing personal worldviews. This underscores the humane qualities of qualitative research and the explanatory approach, which becomes indispensable for comprehending intricate relationships and nuanced situations that far surpass the scope of understanding through random sampling or statistical calculations.

At the center of qualitative research is the search for the most profound meanings associated with reality as perceived and interpreted by individuals (Willig, 2017). Consequently, how people synthesize or make sense of reality, alongside their underlying assumptions shaping behavior, assumes the most significant importance for researchers directing the qualitative

research trajectory (Willig, 2017). White and Cooper (2022) described qualitative as a method frequently used that must be aligned with a particular research design to enforce how the unknown will be discovered. Qualitative research can be conducted in real-life settings, capturing a complete description of information given by the subject through spoken or written words, gestures, emotions, and behaviors (Aspers & Corte, 2019).

Qualitative research is deliberately used for specific purposes in research. It is appropriate for unraveling complex phenomena or those with limited information (Pyo et al., 2023). Leedly and Ormrod (2015) emphasized that qualitative research differs from the route to swift results or straightforward answers. It necessitates enthusiasm and unwavering commitment to understand a situation or process deeply. This often entails extended observation periods, interviews, and subsequent follow-up sessions (Fischer & Guzel, 2023). Therefore, qualitative research justifies the time and effort required to sort out complex phenomena, finding rich details that still need to be discovered in research methods reliant on numerical data and principles (Islam & Aldaihani, 2022). It uncovers a dimension established in thoughts, transcending facile representation through scales and averages, a dimension brought to light through rigorous questioning, interaction, and observation (Busetto et al., 2020).

The rationale for selecting the case study methodology for this study is rooted in the unique attributes and advantages of this qualitative research approach. This study intends to examine the experiences and perspectives of early-career respiratory therapists during their transition from the academic setting through written and clinical simulation examinations and into the early years of practice. Among the array of qualitative research genres available, the case study method emerges as a suitable and illustrious choice due to its tailored fit with the study's context and objectives (Yin, 1998). The case study method is renowned for its distinctive

characteristics that align seamlessly with the research work (Yin, 1998). One of the fundamental characteristics that distinguishes this study is its emphasis on examining a particular subject, which provides a comprehensive portrayal of a phenomenon within the framework of real-world scenarios (Yin, 1998). This also aligns with the study's objective to thoroughly explore the transition experiences of novice respiratory therapist within their professional domains.

The case study method is fundamentally characterized by the emphasis on a singular unit of analysis, which enables a thorough and all-encompassing exploration of the selected phenomenon (Yin, 2009). Utilizing such a methodology facilitates a comprehensive examination of the relationship between the contextual factors and the intricate mechanisms underlying the phenomenon in question (Yin, 2009). Using various data collection techniques, the case study approach facilitates a broad ability (Yin, 2009), which is crucial for finding the complexities embedded in the experience of novice respiratory therapists. Chowdhury and Shil (2021) expressed the unique factors that drive case study research by focusing on investigating a specific event in a real-life setting, the complexity of the relationship, the time frame, the research questions, and the researcher.

An alternative methodology that was considered but was not appropriate for this study was the quantitative research method. Using a quantitative research method would not be suitable for this study because a quantitative method is based on numeric data for understanding outcomes (Mertler, 2019). Quantitative research uses experimental, correlational, or descriptive methods to make predictions, compare, and explain (Mertler, 2019). Because the focus is to examine the experiences and perspectives of early-career respiratory therapists regarding their transition from the academic setting through written and clinical simulation into the work

environment, a qualitative method would be suitable for conducting research rather than using a quantitative method.

An alternative research design that was considered for this study but was not suitable was a phenomenological design. Features of a phenomenological design include descriptive and focused with a decrease of bias by using a group with the same phenomenon, real meaning, and immediate understanding (Moustakas, 1994). A phenomenological design would not be suitable for this study because it uses a holistic approach focusing on the phenomenon as a whole (Moustakas, 1994).

Given the study's objective of exploring the experiences of early career respiratory therapists and understanding the challenges of their transition into the work environment, the case study method proves invaluable. This approach allows for acquiring in-depth detail about events, individuals, or processes, particularly through the lens of thick description, as scholars such as Yin (2009) and Chowdhury and Shil (2021) advocate. Such in-depth analysis is essential for understanding and explaining complex processes involving meanings attributed to specific phenomena (Yin, 2009). While the case study method's potential to find the complexities of an event, issue, individual, or process is evident, the successful execution of the potential relies heavily on the researcher's knowledge, flexibility, and enthusiasm throughout the research process (McQuaid et al., 2023).

Population and Sample

The population for this study was early-career respiratory therapists within the United States who have completed an accredited respiratory care program. Statistics show that out of 9,055 clinical simulation examinations administered in the United States in 2022, only 5,189 were awarded credentials (NBRC, 2023). Approximately 8,600 positions for respiratory

therapists are available in the U.S. each year, with a continuous increase in demand (U.S. Department of Labor, 2023). Early-career respiratory therapists across the United States were an appropriate population for this study. The study's problem and purpose are in accordance with the research questions to better understand what factors may influence the preparedness of early-career respiratory therapists as they transition from the academic setting into the work environment.

The target population for this study was early-career respiratory therapists who have transitioned from the academic setting through written and clinical simulation examinations into clinical practice within the past three years. Participants for this study were recruited through the Qualitative Recruitment Agency, a firm that specializes in the recruitment of participants for social research studies. The agency possesses extensive experience in identifying and recruiting individuals who fulfill specific demographic criteria pertinent to this research. Convenience sampling was used for sample selection from the target population to select therapists who have met the criteria of participating in clinical simulation practices as they advanced through a respiratory care program (Henry, 1990). Eligibility for participation in this study included therapists who transitioned into the work environment within the past three years and currently work in a healthcare setting regarding respiratory care. Each therapist must have completed an accredited respiratory care program within the United States, receiving a minimum of an associate's degree. Therapists must also have undergone written and clinical simulation examinations regarding respiratory training before practicing in the work environment. Exclusion criteria included respiratory therapists who had exceeded three years of working in a healthcare setting regarding respiratory care. Also, therapists who are coworkers or acquaintances, did not attend an accredited respiratory care program within the United States, do

not have a minimum of an associate degree, do not currently work in a healthcare setting, and did not go through written and clinical simulation examinations, do not meet the required criteria for this study. The sample size included 11 therapists who met the criteria and were willing and able to participate. Subedi (2021) suggested that qualitative research has unique characteristics and methods of inquiry and engagement regarding small sample sizes. Therefore, a range between 10 and 14 therapists was appropriate for this study. The process of convenience sampling continued until saturation was met.

Convenience sampling allowed respiratory therapists to be selected from a diverse sample of participants while adhering to ethical and methodological standards. The objective of convenience sampling for this study was to select samples from a group that was accessible with likenesses in characteristics. Convenience sampling is an approach that aligns with the motive of this research, collaborating with the problem, purpose, and research questions (Henry, 1990). The convenience sampling method specifically facilitated the selection in a meticulous manner based on characteristics and qualities (Henry, 1990). The researcher purposefully selected therapists based on their participation in clinical simulation practices during academic studies in a respiratory care program. Focusing on therapists with this distinct experience will give an insightful understanding of the role that clinical simulation practices have in transitioning from the academic setting into the work environment. In this study, saturation is essential because of the study's qualitative nature regarding the research questions. Saturation is reached when all possibilities of finding new data are exhausted (Chitac, 2022). This study assessed saturation through semi-structured interviews, a questionnaire, and observation from recorded Zoom sessions. These items were reviewed repeatedly until no new patterns of information were seen (Guest et al., 2020).

Materials

The primary materials for data collection in this study were a criteria questionnaire, semi-structured interviews, an interview guide, and myself, as the researcher. The criteria questionnaire was comprised of five closed-ended questions based on the required inclusion criteria. The criteria questions that were used are included in Appendix A. Questionnaires are one method commonly used in research for preselection, allowing the researcher to determine the specifics of each potential candidate regarding the characteristics of the objectives of the intended research (Sharma, 2022). The semi-structured interview questions were composed of open-ended questions centered around the research questions. I conducted a field test on the interview questions with two respiratory therapists who were not part of this study. This allowed me to determine if the questions were appropriate and also allowed me to practice interviewing. The semi-structured interview questions that were used are included in Appendix B. A semi-structured interview was appropriate for this study because it allowed therapists to respond to open-ended questions in a manner that reflected conversation in a natural tone (Elhami & Khoshnevisan, 2022). Semi-structured interviews allowed me to initiate a conversation without immediately asking a specific question. After asking each research question, I used the technique of probing. Probing allowed me to get a closer view of statements made by the participants. It allowed me to ask additional questions for more understanding. Probing is a method used in qualitative research. It helps researchers ask questions that gather more details about previous answers (Robinson, 2023). An interview guide is an essential tool that is used for the interview process. Using an interview guide helped to direct the interview by having a preorganized group of open-ended primary and sub-questions directed toward the research questions (Adeoye-Olatunde & Olenik, 2021). This method was significant for me to capture information as the

conversation developed and continued to guide the conversation toward the research objectives (Elhami & Khoshnevisan, 2022). The information processing theory also helped to guide the interview questions, focusing on how early career respiratory therapists collect, make meaning, retain, and recover useful information as they transitioned from the academic setting into the work environment.

Study Procedures

After receiving approval from the National University's IRB committee, initial discussions were held with the Qualitative Recruitment Agency to outline the study's objectives, target population, and desired sample size. The agency agreed to assist in recruiting participants who meet the inclusion criteria. The recruitment agency developed informational materials, including flyers and online advertisements, to attract potential participants. These materials included details about the study, eligibility criteria, and contact information. Interested participants contacted the recruitment agency, which conducted a pre-screening interview to assess eligibility. Those who met the inclusion criteria were invited to participate in the study. Eligible participants were provided with detailed information about the study, including potential risks and benefits. Informed consent was obtained prior to participation, and participants were given the opportunity to ask questions. Participants were compensated for their time and contribution to the study as stipulated in the agreement with the recruitment agency.

Once participants were recruited and provided informed consent, interviews were scheduled based on participants' availability and conducted through Zoom sessions. Zoom is a virtual platform that allows interpersonal communication in real-time, including tools for chat, audio, recording, and visuals (Zoom, 2023). During the interview process, each participant was assigned a unique alias to protect their privacy and identity. Each participant was also informed

that the interview would be recorded through tools on the Zoom platform, and they may stop the interview at any time without repercussions. In addition, member checking supported participants; they had access to review the interview transcript for the accuracy of their responses. Therapists who were interviewed received a transcript through email to evaluate and provide feedback. Member checking is a source to provide the study with accuracy and credibility (Motulsky, 2021).

Data Analysis

This study used the method of reflexive thematic analysis to analyze data. Reflexive thematic analysis is an approach to searching, finding, and examining patterns embedded in the data to create meaningful themes (Braun & Clarke, 2021). Reflexive thematic analysis aligned with the study's qualitative characteristics for interpreting respiratory therapists' experiences, emotions, and thoughts (Braun & Clark, 2021) regarding their transition from the academic setting into the work environment. A codebook consisting of categorized themes was created through the six stages of thematic analysis (Braun & Clarke, 2021). The first stage was to become familiar with the collected data (Braun & Clark, 2019). An important method that was used in this study to familiarize data included creating and reviewing transcripts through written, video, audio, and note-taking. Note-taking is a common and effective method for recording short pieces of information that show importance and require the researcher to make critical selection choices (Fanguy et al., 2023). All notes were categorized and labeled systematically, including the documentation of word choices, expressions, gestures, and tone of voice. Journal entries and note cards were also used to document and familiarize data. Consistently examining the data for accuracy and effectiveness is essential for the outcome of the analysis (Morgan, 2022). Transcripts are essential to the analysis process and must be carefully written to include every

detail that will have meaning for interpretation (McMullin, 2023). The second stage of reflexive thematic analysis is to create codes for the data (Braun & Clark, 2021). This study used an inductive approach to meticulously gather data as the participants directly relayed information through gestures, descriptive words, phrases, and numbers (Bingham & Witkowsky, 2021). Codes were created from an inductive approach as a systematic method for identifying different parts of the data (Bingham & Witkowsky, 2021). In addition to using a manual coding process, the data software NVivo was used to assist in organizing and managing the data.

The third stage was to produce themes. A deductive approach was used to categorize and create themes based on the information processing theory (Bingham & Witkowsky, 2021). This method answered each research question based on the final themes. The fourth stage was to evaluate and build the themes. Themes were sorted out to align with the most specific data relating to the overall focus of the study based on coded data (Braun & Clark, 2021). Themes and codes were most important for data organization and association (Braun & Clark, 2006). The themes used for this study were determined by the frequency of repeated and similar data from codes and then placed into sections based on frequency (Byrne, 2022). The fifth stage was to label the themes. This study labeled themes based on meaning, followed by a brief report of the main points (Braune & Clark, 2021). The final stage was to generate the findings. This study evaluated each theme by examining labeling for appropriateness and order (Braun & Clark, 2006).

Assumptions

The first assumption for this research is that all respiratory therapists selected as participants will have positive intentions toward the research and answer each interview question with integrity. The assumption that all respiratory therapists have positive intentions and meet

the specific criteria may limit transferability. If participants' intentions or characteristics vary in different contexts, the findings might not be directly applicable. Understanding the experiences and perspectives of how early-career respiratory therapists acquired preparation through clinical simulation will give insight into the problem of early-career respiratory therapists entering practice with insufficient preparation. A second assumption is that each therapist who agrees to participate meets the requirements of not having more than three years of work experience, having a minimum of an associate degree, currently working in a healthcare setting, having undergone written and clinical simulation examinations, and having completed an accredited respiratory care program within the United States. This study will acquire in-depth descriptions of the encounters and views of early-career respiratory therapists and the challenges they face when entering the workforce. Also, the assumption that I, the researcher, will not have biases towards early career respiratory therapists or the research findings. An additional assumption is that therapists selected as participants will be willing and able to participate in the study.

Limitations

Qualitative research uniquely captures the psychological and social aspects of the objectives. However, the researcher as a tool was at the center, meticulously handling and directing every part of the study (Muzari et al., 2022). Consequently, in this research study, triangulation was limited regarding data collection. This study used online interviews through Zoom to collect data from participants. Qualitative research has opportunities for in-depth exploration from the social and psychological perspectives (Muzari et al., 2022). This opportunity could have been practiced more effectively if additional data collection methods had been implemented. Interviews and questionnaires are a productive method for gathering data, but in-person engagement would have been more effective. To mitigate this limitation, future studies

could incorporate additional data collection methods such as direct observations or focus groups. Interacting with participants in person would have meticulously captured attitudes, gestures, and reactions, such as breath sounds and body movements (Muzari et al., 2022).

An additional limitation is the sample selection criteria. Some participants may have higher educational degrees, which might affect transferability, as the experiences of those with different educational backgrounds may vary. One of the criteria required for participants for this study was to have a minimum of an associate's degree. However, some therapists selected for this study may have a higher degree than an associate's, such as a bachelor's or master's degree. Having different levels of educational training may influence the outcome of the study. Collecting information on education levels during the preselection process may help mitigate the influence of varying levels of educational training on the outcome of the study. However, future studies are needed to determine how different levels of education impact early career respiratory therapists regarding their transition from the academic setting through written and clinical simulation examination and into the early years of practice.

Delimitations

Delimitations in research are the restrictions implemented by the researcher to focus on the study's main objectives (Coker, 2022). In this study, a delimitation is early-career respiratory therapists who have transitioned from the academic setting through written and clinical simulation examinations into clinical practice within the past three years. The experiences and challenges faced by early-career therapists might differ outside the defined timeframe, and the qualitative case study design may not be universally applicable. Early-career respiratory therapists face various challenges as they enter the work environment regarding skills that must be met (AARC, 2023). Clinical simulation practices significantly influence student success

regarding hands-on training (Davis et al., 2022; Khathlan et al., 2022; Violato, 2022; Terry & Ari, 2022; Ogradnick et al., 2020). Another delimitation in this study is a qualitative case study. A qualitative method produces meanings associated with reality as perceived and interpreted by individuals (Willig, 2017). In this study, a case study design emphasizes examining a particular subject, providing a comprehensive portrayal of a phenomenon within the framework of real-world scenarios (Yin, 1998). The principles of Miller's (1994) information processing theory are delimited because of the relevance to training, education, and how students can store and retrieve lessons (Mayer, 1975).

Ethical Assurances

Before data collection, this study received approval from the University's Institutional Review Board (IRB). This study caused minimal risk to participants. After the sample was selected and each participant agreed and was able and willing to participate, they were informed of the objectives and characteristics of the research and interview. The participants submitted an informed consent form in writing before proceeding with the interview process. Each participant was assigned a unique alias to protect their privacy and identity before the interview process. Each participant was informed that the interview would be recorded through tools on the Zoom platform and that they may stop the interview at any time without repercussions. All documents and collected data were electronically stored and password-protected. As a respiratory therapist, the issue of bias was minimized through triangulation methods in data collection and analysis. The role of the researcher was to reflect transparency and flexibility throughout the study by making decisions and following ethical guidelines (Korstjens & Moser, 2018).

Summary

The purpose of this qualitative case study was to examine the experiences and perspectives of early-career respiratory therapists regarding their transition from the academic setting through written and clinical simulation examinations and into the early years of practice. A qualitative methodology focuses on the whole behavior, attempting to uncover the direct thoughts regarding the experiences, events, and occurrences that allow meanings to be determined (Lima & Newell-McLymont, 2021). Through convenience sampling, this study sought to select between 10 and 14 therapists from the target population of early-career respiratory therapists who had transitioned from the academic setting into the work environment within the past three years. The primary data collection tools included a criterion questionnaire, semi-structured interviews, an interview guide, and me, the researcher. The method of reflexive thematic analysis was used to analyze data using inductive and deductive approaches. Completing the six stages of thematic analysis allowed a codebook consisting of categorized themes to be created (Braun & Clark, 2021). However, the transferability of this study was limited by the assumption that all participants had positive intentions toward the research and answered each interview question with integrity.

Chapter 4: Findings

Early career respiratory therapists are expected to enter the workforce with skills to build upon as they gain experience (Behr et al., 2022). When early-career respiratory therapists lack skills in managing clinical activities and using medical tools and techniques, medical facilities are impacted by having to provide additional training (Erkinger et al., 2022). Simulation practices are used in respiratory care programs to acquire the skills needed for training and preparation for entering the workforce (Yanes & Nastars, 2022). The purpose of this qualitative case study was to examine the experiences and perspectives of early-career respiratory therapists regarding their transition from the academic setting through written and clinical simulation examinations and into the early years of practice. The problem addressed in this study was that early-career respiratory therapists are entering practice with insufficient preparation (Baoum et al., 2023; Piccuito & Santiago, 2023). The event of COVID-19 illuminated the skills needed to enter the workforce, leaving recent graduates unprepared for their clinical simulation examinations and uncertain about the transition from their academic programs through written and clinical simulation examinations and into the early years of practice (Varekojis et al., 2022). Data collection in this study included a criterion questionnaire, semi-structured interviews, an interview guide, and me as the researcher. The semi-structured interview questions were composed of open-ended questions centered around the research questions.

The research questions were developed to better understand the perspective of early career respiratory therapists regarding their preparedness as they transition from the academic setting through written and clinical simulation examinations into the early years of practice. The research questions included:

RQ1

What are early career respiratory therapists' perspectives regarding their skills in working with interdisciplinary preparedness to transition into the workforce after completing the clinical simulation examinations?

RQ2

What do early career respiratory therapists perceive as factors of the simulation practices that facilitated or interfered with preparedness to work independently when entering the workforce, particularly within interdisciplinary teams?

RQ3

What are early-career respiratory therapists' perspectives regarding preparedness to approach the credentialing examinations?

This chapter first includes a discussion of the trustworthiness of data: establishing credibility, confirmability, transferability, and dependability in the findings. A presentation of the results follows, with key themes and patterns highlighted, organized by research question. An evaluation of the outcomes in the context of theory and prior research is next. The chapter concludes with a summary of the main arguments discussed to reiterate the worth of the contribution the findings make towards an understanding of preparedness in early career respiratory therapists.

Trustworthiness of the Data

Trustworthiness in qualitative research means that the data collected is strong and reliable (Lincoln & Guba, 1985). As Lincoln and Guba (1985) asserted, trustworthiness in a qualitative research study refers to the way the study is designed to capture the perspectives of the participants it involves and the content that has been studied. To enhance trustworthiness in this

study, several strategies are involved, including credibility, transferability, confirmability, and dependability.

Credibility

Credibility, as described by Wood et al. (2020), reflects the various strategies researchers take to ensure that their findings are, in fact, representative of the phenomenon identified. In essence, credibility in qualitative research and internal validity in quantitative research are parallel concepts. The researcher demonstrates trustworthiness by adhering to accepted procedures for qualitative research and establishing an appropriate rationale, as further supported by Stahl and King (2020). In this study, I incorporated a member-check procedure whereby participants were able to check their transcripts for accuracy, and all 11 participants received their transcripts and found a consensus that the findings were accurate.

Transferability

Transferability pertains to how broadly the findings of a study can be generalized or utilized in different contexts or among various populations (Kyngas et al., 2020). Kyngas et al. (2020) explained that for the transferability of findings in this study, the researcher gave an elaborate description of the methodology, including the participants and the criteria for their inclusion and exclusion. This elaboration allows the reader to conceptualize how the participants were selected and in what ways these findings may be generalized to other contexts as well. On the other hand, such detailed information also enables readers themselves to consider the contexts through which the findings may also be valuable or transferable. In light of the methodology implemented in this research study, these findings are considered transferable to similar research contexts.

Confirmability

Confirmability refers to the extent to which data collected is free from biases of the researcher or any preconceived notions of the researcher (Stahl & King, 2020). According to Nassaji (2020), it is important to show that qualitative research is conducted objectively without biases or assumptions of the researcher. In this study, the researcher used a thematic analysis approach, where data were repeatedly read and coded, patterns were identified, and themes were developed. This is the basis on which the research method was put into place to maintain objectivity throughout the process. I further enhanced confirmability by being reflexive or critically reflecting on personal biases and assumptions during the study.

Dependability

Dependability pertains to how easily another researcher can replicate a study and obtain consistent, reliable outcomes (Stahl & King, 2020). Dependability is the stability of the research over an extended period. I utilized an audit trail for this study to facilitate dependability. The detailed documentation entails an audit trail of all the stages involved in the research process: the field notes, audio recording, and data analysis files. In the process of data collection and analysis, the study maintains an audit trail that enhances transparency in the research study, thus making it dependable (Stahl & King, 2020).

Results

This section presents the findings of the qualitative inquiry concerning early-career respiratory therapists' experiences and views in relation to their transition from academic settings into clinical practice. A case study design is generally used to investigate the experiences of people within their real-world context (Yin, 1998). Data collection combined the use of a criterion questionnaire, semi-structured interviews, and an interview guide. While the eligibility

criteria questionnaire contained closed-ended questions, semi-structured interviews entailed open-ended questions that allowed the participants to express themselves freely in the discussions.

Participants were recruited from an online recruitment agency named Qualitative Recruitment Agency and were limited to only those early-career respiratory therapists who transitioned into clinical practice within the last three years. All 11 participants were subject to the criteria questionnaires in the establishment of the eligibility and then underwent one-on-one interviews, which were recorded and transcribed for analysis. Interviews were guided by an interview framework that allowed flexibility to allow the emergence of relevant themes and topics to be organic in discussions. I got detailed accounts of the experiences and reflections of participants while they discussed the challenges of transitioning into their professional roles.

The demographic characteristics varied and reflected a relatively diverse population of early-career respiratory therapists. The 11 participants ranged in age between 23 and 52. All participants had completed an accredited program in respiratory care, generally at the associate degree level or higher. The participants were employed in various healthcare settings, including hospitals, rehabilitation centers, and outpatient clinics, thus providing a broad perspective on the experiences of new graduates in different clinical environments. This diversity enhances the richness of the data, enabling the elicitation of a thorough understanding of the factors that influence preparedness and the transition process for early-career respiratory therapists (see Table 1).

Table 1

Summary of Participants' Educational Background and Experience in Healthcare Settings

Participant	Educational Background	Years of Experience	Healthcare Setting
Participant 1	Inner Service Program	8 months	Hospital
Participant 2	Bachelor's in Allied Health	3 years	Hospital
Participant 3	Associates Degree	3 months	Hospital
Participant 4	Bachelor's in Sociology	3 years	Outpatient
Participant 5	Associates Degree	2 years	Hospital
Participant 6	Master's Degree in Respiratory	1 year	Rehabilitation
Participant 7	Associates Degree	1 year	Hospital
Participant 8	Bachelor's in Applied Science	3 years	Rehabilitation
Participant 9	Bachelor's in Respiratory Therapy	2 years	Outpatient
Participant 10	Bachelor's in Liberal Arts	1 year	Hospital
Participant 11	Associates Degree	3 years	Outpatient

Data analysis was performed using reflexive thematic analysis, which is a methodological approach that focuses on identifying and examining patterns in the data to construct meaningful themes (Braun & Clarke, 2021). This was considered suitable for interpreting the experiences, emotions, and thoughts of respiratory therapists while transitioning from academic settings to the professional environment. The analysis was based on the steps outlined by Braun and Clarke (2021), which assures a systematic and thorough exploration of the qualitative data obtained during the semi-structured interview.

The first phase was familiarization with the collected data, achieved by transcribing and studying the transcripts that were extracted from audio recordings and taking meticulous notes during interviews. The approach of note-taking meant to capture important information required

critical selection to feature only significant aspects of participants' responses. I used the journal entry and note card methods to jot down observations of the setting to fully capture every contextual detail of the data with regard to words expressed, gestures, expressions, and tone of voice. Reflexivity played a significant role, where I remained attuned to their assumptions and preconceptions likely to influence data interpretation. Reflexive practice assisted me in making the data reflect the experience of the participants rather than being guided by their assumptions.

The second phase involved the coding of data. In this process, an inductive approach was applied in such a way that the researcher was able to detail various elements within the data systematically as participants would express themselves through descriptive language and non-verbal communication cues (Braun & Clarke, 2021). Coding was manually developed and supported the use of NVivo software in supporting ways in which the data could be sorted out and arranged. In the third phase, themes were developed from the coded data. The deductive approach was used, where the information processing theory provided the framework through which themes were categorized and developed to directly address the research questions. Themes were sorted and aligned to specific data points so that they were relevant to the study's focus. Throughout this coding and thematic analysis process, reflexive consideration was continuously demanded, where I paused regularly to reflect upon the possible impact of my beliefs and background upon the processes of coding and interpretation. In being reflexive, the risk of bias was reduced, and the data were ensured to reflect the voice and experience of the participants.

The fourth phase was the assessment and refinement of the themes. This included sorting through the themes carefully to align better with the most relevant data, emphasizing the organization of themes and their association with codes, as recommended by Braun and Clarke (2021). The themes that were selected depended on repeated instances of similar data; hence, the

most important patterns were clearly observed. During this assessment process, reflexivity played its part, whereby I continually evaluated the potential impact their interpretation and conclusions could possibly make upon the refinement of the theme. Reflexive practice enabled me to ensure the finalized themes were actually representative of the voice of the participants and the nature of the data, and not subject to the influence of their own assumptions and biases.

The fifth phase was the naming of the themes, where each of the themes was given a meaningful title, accompanied by a short report summarizing the main points that were associated with each of the themes. The sixth phase was the generation of the findings, which involved a careful review of each theme to assess its appropriateness and order within the context of the study. This structured approach to the analysis of data meant that the emerging themes would represent an accurate reflection of the participants' experiences and provide rich insights into their transition into professional practice. I identified 30 initial codes, which were then categorized into 16 final codes. I was then able to generate the six general themes summarizing the experience and perceptions of the participants during their examination and training processes. Table 2 in Appendix C shows the codes, categories, and themes for both research questions 1 and 2.

Research Question 1: What are Early Career Respiratory Therapists' Perspectives Regarding their Skills in Working with Interdisciplinary Preparedness to Transition into the Workforce after Completing the Clinical Simulation Examinations?

With this research question, I aimed to find out about the perspectives of early-career respiratory therapists regarding their skills in working with interdisciplinary preparedness to transition into the workforce after completing the clinical simulation examinations. After the data analysis process, two themes emerged that helped to answer the first research question. The two

themes are (a) Skill Acquisition and Confidence Building and (b) Program Evaluation and Support.

Theme 1: Skill Acquisition and Confidence Building. The first theme described the skill acquisition and confidence-building that respiratory therapists acquired as they transitioned into the workforce after completing the clinical simulation examination. Study participants mentioned how they used different methods to memorize some of the procedures. For example, participant 4 mentioned how they listened to songs repeatedly and, in the end, learned and memorized several procedures. Participant 4 said,

Sometimes, it's silly songs for me. It is kinesthetic and alphabetic. So, I know this is where I'll actually set up my equipment on the counter outside the room, the alphabet in alphabetical order, and I have them, you know, memorized, and then, when I take them in the room, I go through them a second time. Did I miss anything? And then, I go through the speech that the doctor will ask. He'll say, you know, do we have a blade? Do we have a tube? Do we have a style? You know, I kind of go through his order once I get in the room because he's going to ask in a different order than the way I remember it.

Study participants mentioned that they benefited a lot from having hands-on experience when they were in school. Participant 1 acknowledged that the hands-on experiences gave students a lot of practice and also made it easy for the students to understand what was being taught. The confidence level could also build up as the students continued to practice. Participant 1 said,

Definitely the hands-on experience. I mean, that's where you get a lot of your practice from: doing it in person. Oh yeah, hands-on, hands-on, all the way. Learning the book stuff is the foundation, but getting the practice in with your hand is what was most

important for me. That is something we practice hands-on, so it took me a little bit to actually get quote-unquote good on them, but I was confident enough to at least know where I'm aiming to know how to palpate an artery and how it's different from an IV obviously but getting hands-on experience I think was the biggest strength for me.

Different techniques were used by students to help them memorize procedures.

Participant 9 used acronyms such as ROME, saying, "A lot of times we, we had little sayings for the things we did, so it helped us, you know, it helped us memorize things easier."

Participant 6 used flashcards, which they could put in their pockets and read during the day whenever they wanted to remember something. Anytime they forget something, they will reach out to their pocket for the flashcard and read. Participant 6 said,

Flashcards. I even have my flashcards when I go to work every day. I have like small cards. I just write something, and like when I start walking, I always have my small flashcards. I just put it in my pocket. I read when I want to remember something or I forget something; I just have it in my pocket.

Participant 8 acknowledged that having hands-on experience when in class helped to improve the confidence level of respiratory therapists. Participant 8 said that they would understand better when they are actively involved in kinetic simulations rather than just visual or reading about things. When students engage in hands-on practices, knowledge retention is higher than when the knowledge is passed theoretically. Participant 8 said,

I feel like my confidence would be an eight out of 10. I personally tend to learn better by doing activities, like actually active, you know, kinetic simulations rather than just visual or reading about it. I think hands-on is always the better learning way because it's something that you don't tend to forget. But I think just having those simulations and

going over them, I think repetition is the best way to go about it. Because even if the only thing is that even in real life, it's not always going to be the book, it's not always going to be how it is in the books, but you have, like I said, you have your foundation to fall back on if needed.

The first theme was how respiratory therapists learned some of the skills and became confident to make the transition to workforce practice based on their clinical simulation experience. Participants used various learning strategies to remember specific procedures, including songs, acronyms, and flashcards. The participants indicated that the hands-on experiences significantly improved their knowledge and confidence levels. Most of them agreed that participation in active simulations enhanced their knowledge retention and real-life preparation and further broadened their practical competencies in the work environment.

Theme 2: Program Evaluation and Support. The second theme described how respiratory therapists were supported as they transitioned to workforce practice based on their clinical simulation experience. Study participants spoke about receiving guidance from other clinical specialists in the interdisciplinary team. For example, Participant 2 mentioned seasoned respiratory therapists and clinical education coordinators who worked with the students step by step on everything. Participant 2 said,

Oh, the level of guidance was excellent. Yeah, it was excellent. We had seasoned respiratory therapists and clinical education coordinators hand by hand with us. And they did everything step by step in the beginning just to make sure we understood what to do and things like that. So, the guidance was great. We weren't just on there by ourselves. We did have that time, of course, you know, afterward, if you wanted to you know, do

any additional training, any additional simulations on your own. But from the beginning everything was walked with step by step.

Participant 4 mentioned that there were incredible teachers in their school who gave them guidance. The teachers did not leave the students alone whenever the students felt uncomfortable doing something. Participant 4 even gave an example of how they learned to stick with both hands, saying,

They are incredible teachers. They are very willing to come alongside you and help you out. They will not leave you alone if you are uncomfortable doing something. The mentorship program there is incredible. I learned how to stick with both my right and my left hand really quickly. And because COVID had already started, a lot of therapists, you know, our clinical educators were like, you're going to have to learn how to stick them more than just this perfect way with the mannequin in the correct position.

Participant 7 said that they were more comfortable and less nervous because of the support received from the educators in the program. Teachers were present to help the students even when they were in their small group discussions. In case of any problems or questions, the teacher was there to provide the necessary support. Participant 7 said,

They make me feel more comfortable and less nervous because you are nervous when you are just thrown in there by yourself. You don't have the support of the teacher.

Because in my program, when we went to clinical, we had the teacher next to our small groups. So, any problems or any questions you had, you had someone other than just me and the therapists. So that was good.

Study participants realized that not all things learned during class could be experienced

in the field. For example, participant 2 said that patients would show signs and symptoms different from what they learned during class, which could make things difficult for respiratory therapists. Sometimes, the students were not exposed to everything that they could potentially face when in the field. Participant 2 said,

Because a lot of the time when you are seeing patients, it's not textbook what you see or what we learn in school. There are some things that do correlate, but then there are other things that don't, and you're taught to think a certain way to look for specific signs, but they don't always present themselves that way, and that can sometimes make things difficult. One of the weaknesses is just not being able to see everything we read in the textbooks in the real world because even in clinical practice and even simulation scenarios, I mean, they're it's a question, you know, you're not actually seeing it in real person so I would say a weakness is just not being exposed to everything that you've learned.

Participant 7 encountered situations that were new to them and, therefore, needed the manager's support. Participant 7 confessed that the introduction of nitric was new, and the school had not taught them how to deal with a nitric situation. Other clinicians could be able to handle the nitric issue, and therefore, participant 7 observed how to handle the situation. Participant 7 said,

I told the manager, "Listen, I'm not ready for this. I don't know how to deal with this, the nitric. I'm not familiar with the nitro. I didn't practice on any nitric during school, so teach me what I should do. Then, after that, when I saw somebody going to a patient, encouraging and bringing in patients from the O.R. with the nitric, I just went with them, just shadowing, to see what and how they do everything.

The second theme showed the level of support provided to respiratory therapists during the transition into workforce practices based on their experiences in clinical simulation. The participants appreciated the mentorship and guidance offered by experienced therapists and instructors. Mentorship evoked confidence in the participants; however, they mentioned that most learning in reality was different from classroom practice and, therefore, was a challenge. This ranged from limited exposure to patient scenarios, for which extra guidance and support were necessary from other colleagues when they faced situations they were not familiar with. The study revealed that the skills for interdisciplinary readiness were strongly enhanced by hands-on experience and supportive mentorship by the novice respiratory therapists during their practice simulations. Participants also reported the use of memorization tools, such as flashcards and song lyrics, which, they reported, enhanced their levels of confidence.

Research Question 2: What do Early Career Respiratory Therapists Perceive as Factors of the Simulation Practices that Facilitated or Interfered with Preparedness to Work Independently when Entering the Workforce, particularly within Interdisciplinary Teams?

In the second research question, the researcher aimed to find out what early career respiratory therapists perceive as factors of the simulation practices that facilitated or interfered with preparedness to work independently when joining the workforce, particularly within interdisciplinary teams. I conducted a thematic analysis, and two themes emerged that helped answer the second research question. The themes were (a) Communication and Collaboration in Practice and (b) Supportive Simulation Practices and Feedback.

Theme 3: Communication and Collaboration in Practice. Eight participants contributed to the formulation of the third theme. Communication was mentioned by several participants as an enabling factor that facilitated or interfered with the preparedness to work

independently when joining the workforce. Study participants mentioned that they had to learn how to communicate well with everyone, including doctors, nurses, and healthcare providers. Participant 6 emphasized this by mentioning that their professor asked them to learn how to communicate well with everyone, saying,

Communication wasn't like during school; our professor always told us how to communicate with different kinds of people: even patients, doctors, nurses, any healthcare provider, anyone in the hospital. So, I think it wasn't like that much from the school. It's, like, it depends on my personality. So, even in school, they taught us all how to talk, how to do, how to say some stuff, but for me, it wasn't like I didn't see it like something because personally, I know how to talk, so it wasn't something for me.

Participant 8 said that respiratory therapists need to learn how to pass information and become their own voice in the team. While the nurses could pass the information to the patient, respiratory therapists were encouraged to learn how to share information with the patient.

Participant 8 said that they have been practicing how to communicate for several years, saying,

I think it's very important. I do, I will say, I think it's very important that, as a respiratory therapist, you can learn to become your own voice in the team. Like, instead of kind of having, the nurse pass along information for you, like no, you're the one giving the respiratory standpoint for this case. Like, I think that's very important. That's something that I've been working on for the last couple of years now.

Respiratory therapists work with different people in the hospital, and sometimes, the most challenging thing is how to communicate with everyone in a way that they can understand.

Working in different facilities required study participants to learn how to communicate well.

Participant 2 acknowledged that communication is a skill that people need to have across the board. Participant 2 said,

The most challenging thing would be communication because, like I said, we all come from different backgrounds and things like that. And when you are at certain facilities, depending on that kind of facility, that's the way I feel, though the communication roles you know you have the physician, of course, and the RT I work under, but I still have to have a voice, and I learned and noticed that by going from different facilities.

Communication is always across the board. It's just the way you communicate and that particular facility.

Collaboration during the simulation practices influenced the preparedness to work independently when entering the workforce. Since most respiratory therapists had less experience, they would ask for help whenever they were unfamiliar with a certain situation. For example, Participant 3 asked for help on how to deal with a patient who had a psychological problem. Participant 3 said,

Lack of experience. In my experience, I've dealt with a patient that I just didn't know what to do. This patient was very; they had like a psych problem. So, I just didn't know how to talk and speak to this patient. I had to ask my colleagues, and I had to ask my supervisor about how it works and which one I talk to in the interdisciplinary team. Do I talk to social services about this? Do I talk to behavioral about this?

Participant 11 appreciated the help they received when they were doing their internship. When new respiratory therapists received help from their colleagues, the fear of handling new conditions faded away with time. Participant 11 encouraged other students to be objective when seeking help, saying,

I think for the student, it does depend on who you know, who's helping them. So, let's say they are in the internship; I think somebody who gave me the courage was, you know, the person who helped me out. So, it's going to be a scary experience for them, of course. But having the objective and knowing how this process is important for you as the RT, and this is going to be your daily life; you have to manage this. It'll be you know, it can be easy for them. So, I think it can be scary at first, but when somebody explains to you how this is going to be important in your career, then you're going to get away with that fear.

Theme three explained the necessity of communication and collaboration during the Practice or entry of respiratory therapists into the workforce conditions. The participants indicated a necessity of effectively communicating with each category of healthcare professional, either at the doctor or nursing level, and stated how comfortable, confident, and ready they were to start their practices due to helpful collaboration in simulation practices. Several participants reported seeking assistance from their colleagues whenever they encountered something that was unfamiliar to them; supportive interactions made their transition smooth and further solidified the importance of teamwork in patient care.

Theme 4: Supportive Simulation Practices and Feedback. The fourth theme described how simulation practices and feedback from clinicians helped respiratory therapists as they prepared to work independently in the workforce. Participant 6 learned how to use the ventilator while in school. With constant practice, using the hospital instruments became easy with time. Participant 6 said,

The strength, I would say, ventilator. I used to touch the ventilator a lot, so it was for me.

It was easy because they told us how to do what we got. We had the line and the stuff. So the ventilator wasn't an issue for me like O₂ therapy wasn't an issue for me. I was good, even from my first day of clinical rotations when I was steering in my first semester, so that side was good. So I felt confident from the first time being in the hospital.

Another strength that was mentioned by the study participants was patient assessments. Participant 5 said that during the simulations, one would go through the patient assessments over and over again. When the respiratory therapists go over the assessments severally, they are able to memorize the procedures. The simulations also helped students to prepare well for the credentialing examinations. Participant 5 said,

The strengths are, you know, patient assessments; I guess in the Sims, you go through your patient assessment skills over and over. You know you do the visuals. You do the numbers; you do the oscillations; you do the end, the question, the assessment, and in the Sims, you go over that so much that, like I just told you, when I go do my vent checks, or whatever, that's the first thing I do. I look at the room first, and I think, I have that flow that was kind of ingrained when preparing for the simulation exams. Combine that with our clinicals. It's kind of, yeah, it's it becomes second nature eventually.

Setting clear protocols in the hospitals was said to be a supportive aspect for respiratory therapists. Participant 2 said that the protocols help students to have autonomy in making decisions, "Because with those protocols, they give us, like I said, the autonomy to be able to make those decisions and make those changes and things like that. The different therapies and modalities that the patient is on." Participant 4 also mentioned that one of the regrets they had was not learning the correct protocols. The COVID-19 pandemic disrupted some things,

resulting in people having to relearn the protocols once the pandemic was over. Participant 4 said,

I wish that while I was doing it the way they asked me to, they would have taught me the correct way, the correct protocol, because then when COVID started slowing down, it was almost like I had to relearn things because protocols had gone back to our normal and I didn't know our normal at that time. I only knew what we were doing at the moment. So, a big part of it was having to relearn some things when COVID calmed down.

One of the weaknesses that interfered with the preparedness of respiratory therapists as they transitioned into the workforce was the lack of experience. Participant 11 had no experience of knowing what to do and no experience of knowing how to interact with patients. One limitation that was mentioned was that Participant 11 did not know how to give feedback interpretation to a patient and how to put in emotions. Participant 11 said,

For the weakness? Let's start with, I didn't have much experience, so I didn't know what to do, and, most times, I didn't know how to interact with my patient. So that kind of limit was like a limitation something I didn't know how to give feedback interpretation to patients during the early time of my career. So, I would struggle with how to interpret the feedback, how to put in the emotions, when to stop, and when to talk. I, you know, I would just talk without minding. I also had a hard time fitting into the working environment.

The fourth theme highlighted how the practices of simulation and feedback by clinicians prepared the respiratory therapists to work independently. Participants explained how frequent use of ventilators and other equipment consistently instilled confidence in themselves through

early clinical rotations and helped them solidify those identified skill sets into spontaneous responses in patients. The existence of established protocols allowed some level of independence in decision-making, though a number of participants still experienced difficulties due to inadequate experience and training, specifically in interacting with patients and communicating on an emotional level.

Effective communication and teamwork are essential for early-career respiratory therapists to successfully engage in autonomous work within interdisciplinary teams. Participants reported supportive practice during the simulations, and feedback enhanced their capability and confidence when applying the skills clinically. Even though the direction given during the simulations was very much appreciated by them, many confessed that the limitations placed by experience, particularly patient interaction and communication about emotions, hindered them during the transition into the workforce.

Research Question 3: What are Early Career Respiratory Therapists' Perspectives Regarding Preparedness to Approach the Credentialing Examinations?

The third research question aimed at explaining the perspective of early career respiratory therapists with regard to preparedness to approach credentialing examinations. After conducting the data analysis process, two themes emerged that helped to answer the third research question. The themes were (a) Exam Preparedness and Support and (b) Exam Challenges and Emotional Responses.

Theme 5: Exam Preparedness and Support. Eight participants contributed to the formulation of the fifth theme. Study participants mentioned that they felt ready to take the exams because teachers had done a good job in preparing them. For example, Participant 2 mentioned that they were one hundred percent prepared, saying, "I was pretty much prepared a

hundred percent. I studied regularly; I used different things, studied Lindsay Jones and Kettering, and stuff like that. So yeah, I was pretty prepared. So yeah, I was extremely prepared.”

Participant 9 mentioned that they did a lot of preparation on their own. Participant 9 was a note-taker, using simulations and flashcards, saying,

I did a lot of preparing on my own. We did, you know, we did have our classes and our simulations and things of that nature. I was a note-taker, even simulation sometimes, you know, I did flashcards, I did, you know, I read my own books. I watched videos; I did a lot of things. I went in not, I wasn't sure, you know, if I was going to pass or if I wasn't. I just went in and said, you know, I've been preparing. I'm going to do my very best. And I just did really well.

Participant 11 said that they had access to study resources while they were in school. The study resources, such as textbooks and practice exams, helped in preparation. Students also worked in groups to prepare for the exams. “After going through the study resources severally, my confidence to go for the exam increased,” Participant 11 said,

I had done my comprehensive study plan. I had studied for it, I had also done my, like, had my resources, so the courses, the textbooks. I also had done practice exams, the previous exams. So, I had done practice exams. I had study groups with my colleagues. So, I think I had enough resources just to be confident enough that I'm not going to fail. So, of course, we had the textbooks, we had the practice text, but I think we would have more resources.

Family and friends also provided quality support to students who were about to sit for

their credentialing examination. For example, Participant 5 mentioned that their family was very supportive. Friends and classmates were also there to offer support whenever there were questions to ask. Participant 5 said,

My family, I was very blessed to have everyone there by my side. Family definitely, they were very supportive. Yeah, I was very blessed with a good support group. My classmates at school also, my instructors. If I ever struggled, if I ever had issues or questions, go to them. And they got me. So yeah, definitely, again, I was very blessed to have that support system.

Participant 4 mentioned that carrying out simulation practices helped a lot when preparing for the credentialing examinations. Students were able to know the signs and symptoms to look for, especially for the ventilator graphics. Conducting the simulations helped students to know what problems to look at and how to solve them. Participant 4 said,

Practicing some of those through simulations on the event was really helpful when it came to test time. You kind of knew the signs and symptoms to look at, and especially like ventilator graphics when they're on the test or EKGs. We did so many simulations of EKGs so that when you went to take the NBRC exam, when you saw our rhythm or you saw a ventilator graphic, you knew exactly what you were looking at. You knew what problem it was and how to solve it.

The fifth theme highlighted participants' preparation for and support regarding credentialing examinations. Participants felt that they had been well prepared, considering that effective teaching and the availability of study resources in the form of textbooks, practice exams, and group study sessions were made possible. In personal study methods, note-taking and flashcard-making became particularly important; similarly, emotional support did indeed pour in

from one's close circle of friends and family during the preparation time before the exam period. These students reinforced their preparedness through simulation practices that allowed them to identify critical signs and symptoms, thus feeling confident on exam day.

Theme 6: Exam Challenges and Emotional Responses. The fifth theme described the challenges and emotional reactions that study participants had when they were taking their credentialing examinations. Participant 2, when speaking about being nervous during the exam, said, "My biggest challenge was just my nerves. Just making sure that, you know, I remain calm because I'm an okay test taker. Not the best, but I do get really nervous taking tests. That was the only challenge." Participant 3 said that there was a lot of anxiety because a person only gets a few chances to do the exam, saying,

That was a whole different level of anxiety for me because you only get a certain amount of tries. And so, you got to make it right. And it does, you know, it does cost you a lot of money, and as a student, you don't have very much of that. So it was; I was very nervous. I was very anxious throughout the whole process, but you know, a lot of studying and faith would get you through it.

Another challenge that students encountered was the limited number of testing centers. Around their locality. Study participants said that they had to travel over long periods of time for them to get access to a testing center. For example, Participant 1 was not too happy since the area they lived in had only one testing center. Students had to book early in advance since a lot of bookings could be made towards the beginning of the exam period. Participant 1 said,

One thing that I wasn't too happy about was just the area where I lived. There was only one testing center, so it was you had to book months, like almost in advance because, like, you couldn't, the time, a lot of the bookings were taken up because it was the only

center in the area, and they were not only partnering our exam but many other types of clinical exams for other job fields so that was the only thing.

Participant 2 mentioned that the challenge they encountered was getting to the testing center because it was far away. Participant 2 had to drive for close to 30 minutes so that they could get to the testing center. While this was not so much of a struggle for Participant 2, other students were inconvenienced. Participant 2 said,

Yeah, So I had no problems getting to it because I drive. But the testing center was far. So, from my house, I think I was probably driving for about 30 minutes. It was about a 30-minute drive. It was in my state, but it was on the other side of where I live, and that was the closest; I don't think I had anything on my side, but it wasn't inconvenient because I'm very familiar with the area.

Some of the questions on the exam were difficult to understand. Participant 1 said that some of the wording was difficult to comprehend since they were not as straightforward as possible. Students, therefore, had to read multiple times before they could make a decision. Participant 1 said

I think one of my biggest challenges was understanding the questions honestly. The wording can be a little tricky. They're not always straightforward, so yeah, one of the challenges is just understanding the questions and having to re-read them multiple times before I can make a decision.

The sixth theme elaborated on the difficulties and emotional responses to credentialing examinations. Study participants stated that they were extremely nervous and anxious, especially because the exam was a high-stakes test and they had only a limited number of attempts. The participants also identified logistical inconveniences, such as traveling a long distance to the only

testing center in the area, which had to be booked well in advance. Additionally, the complex wording of exam questions posed comprehension difficulties, necessitating multiple readings before making decisions, further contributing to their stress.

The study revealed that respiratory therapists were best ready for credentialing exams through good training, useful study resources, and practice from simulations. Participants were ready from their preparation; however, they also faced serious setbacks, including nerves, logistical worries about the dearth of test locations, and complex test questions. When the test-takers were ready, the high level of the exams amplified their nerves, emphasizing the psychological stress involved in this professional milestone.

Evaluation of Findings

These findings can be discussed in light of Miller's (1994) information processing theory, in that it demonstrated how respiratory therapists process and retain knowledge during their training. Their experiences supported the theory in terms of active involvement in learning, as participants expressed the reinforcement of skills and knowledge through simulation practices. The support for hands-on learning is similar to previous research, such as that of Li et al. (2023), who found that simulation enhances memory retention and cognitive processing in medical training.

For Research Question 1, on the level of support during clinical simulation experience, participants reported the importance of mentorship and guidance from experienced clinicians. Participants reported that hands-on experience and memorization aids, such as songs and flashcards, were useful for them to gain skills and establish their confidence for independent practice. They also welcomed feedback from senior clinicians. However, the real-life scenario turned out differently from the things learned in the classroom, and there was a need for

continuous support in adapting their practice. The literature supports this finding in the sense that students tend to retain more information on content when they have experiences where there is a good environment for collaborative learning. Miller's (1994) theory asserted the notion that collaboration strengthens students' cognitive processing; in return, the student is now capable of encoding any new information into the stored memory. The supportive interactions by participants also created grounds for supporting the results of Loc et al. (2019), which indicated how proper instruction methods facilitate the process of learning.

For research Question 2, the study explored communication and collaboration in interdisciplinary teams. Effective communication and teamwork were the building blocks for the readiness of participants as respiratory therapists. Participants placed emphasis upon interdisciplinary teamwork for the enhancement of patient care. Supporting simulation practice and constructive feedback increased their levels of confidence in their clinical skills. Limited experience with patient interaction and communication skills was the only setback; however, for their transition into autonomous practice and providing opportunities for improvement. Again, this supports Miller's (1994) theory that the thought process is central to learning. This points to the necessity of effective communication among members of the team, further reinforcing that cognitive processing occurs when learners engage in purposeful discussion with others to build knowledge. In essence, the findings pointed out how communication was one of the important factors in learning.

Research question 3 explored participants' perceptions of their preparation for the credentialing examinations. Participants felt adequately ready for their credentialing exams by virtue of good pedagogy, access to study guides, and good study environments, including study groups. Family and friend support enhanced their level of confidence. However, the test-takers

faced serious challenges, including test anxiety and nerves resulting from the high-risk level involved in the tests and logistical issues, including the limited test stations and complex test phrasing. This can be explained by Miller's (1994) model, which argued that cognitive load affects memory retrieval. This anxiety among participants may hinder the proper processing and recall of information; hence, it is a clear area of further research that seeks ways of minimizing such emotional obstacles during high-stakes assessments.

Based on the results stated above, the findings from this study indicated that (a) mentorship and guidance enhance skill acquisition: Participants highlighted the significance of mentorship from experienced clinicians and the value of hands-on experiences and memorization tools, which contributed to their confidence and skill development for independent practice. (b) effective communication and teamwork are important in patient care: participants said that good communication and teamwork among different professionals are very important for improving patient care. This also helps build their confidence in their clinical skills, and (c) feedback and support systems enhance learning: constructive feedback from senior clinicians and supportive simulation practices played a vital role in participants' readiness for both clinical practice and credentialing examinations, indicating that supportive educational environments are instrumental in facilitating successful transitions into the workforce. These findings underline the critical role of mentorship, communication, and supportive learning environments in shaping the preparedness of early-career respiratory therapists as they transition from academic settings to independent practice.

Based on the analysis of this study, a secondary finding is that emotional factors impact exam preparedness. While participants felt adequately prepared for credentialing examinations, they encountered challenges such as test anxiety and logistical issues, which can negatively

affect their cognitive processing and performance during high-stakes assessments. This finding surfaced as an emotional challenge that participants faced despite having the necessary resources and encouraging learning environments. Emotional obstacles are important factors that require further attention. Addressing this issue may be necessary to enhance exam outcomes and overall preparedness of new respiratory therapists as they transition from educational settings to their professional roles.

Summary

The problem addressed by this study was that COVID-19 illuminated the needed skills for entering the workforce, leaving recent graduates unprepared for their clinical simulation examinations and uncertain about the transition from their academic programs through written and clinical simulation examinations and into the early years of practice (Varekojis et al., 2022). Three research questions were developed to better understand factors that may influence the preparedness of early career respiratory therapists as they transition from the academic setting through written and clinical simulation examinations and into the early years of practice.

In the first research question, I aimed to find out the perspectives of early-career respiratory therapists regarding their skills in working with interdisciplinary preparedness to transition into the workforce after completing the clinical simulation examinations. After the data analysis process, two themes emerged that helped to answer the first research question. The themes were (a) Skill Acquisition and Confidence Building and (b) Program Evaluation and Support.

In the second research question, I aimed to find out what early career respiratory therapists perceive as factors of the simulation practices that facilitated or interfered with preparedness to work independently when entering the workforce, particularly within

interdisciplinary teams. I conducted a thematic analysis, and two themes emerged that helped to answer the second research question. The themes were (a) Communication and Collaboration in Practice and (b) Supportive Simulation Practices and Feedback.

The third research question aimed at explaining the perspectives of early respiratory therapists with regard to preparedness to approach credentialing examinations. After conducting the data analysis process, two themes emerged that helped to answer the third research question. The themes were (a) Exam Preparedness and Support and (b) Exam Challenges and Emotional Responses.

Chapter 5: Implications, Recommendations, and Conclusions

The purpose of this qualitative case study was to examine the experiences and perspectives of early-career respiratory therapists regarding their transition from the academic setting through written and clinical simulation examinations and into the early years of practice. The problem addressed in this study was that early-career respiratory therapists are entering practice with insufficient preparation (Baoum et al., 2023; Piccuito & Santiago, 2023). This research utilized a qualitative case study approach, which helped to effectively explore and understand the early professional journey of the sampled respiratory therapists. Criterion questionnaires, semi-structured interviews, and an interview guide were used to collect data. Braun and Clarke's (2021) six-step approach to reflective thematic analysis was applied to data analysis.

The results of this study helped fill gaps in knowledge regarding the perspectives of early career respiratory therapists regarding their preparedness through the academic environment, written and clinical simulation exams, and the actual workplace. The analysis revealed six key themes:

- Skill acquisition and confidence building
- Program evaluation and support
- Communication and collaboration in practice
- Supportive simulation practices and feedback
- Exam preparedness and support
- Exam challenges and emotional responses

However, the study had its drawbacks, as I assumed all the participants had positive intentions and did not falsify the information given during interviews. Furthermore, the transferability of the findings might be restricted by the fact that participants had different educational experiences, depending on their degrees. Chapter 5 presents the discussion of implications, recommendations for practice, and suggestions for further research. Also, various factors that might have influenced the interpretation of the results are discussed, including (a) the level of education, (b) sample size, (c) self-reporting bias, (d) different clinical simulation experiences, and (e) demographic and professional background.

Implications

The findings of this study have various suggestions for the field of respiratory therapy education and practice. This research highlights the important role of mentorship, hands-on experience, and effective communication in preparing early-career respiratory therapists for the workforce. By comparing these findings with existing literature, we can confirm, confront, and extend prior research, contributing to a deeper understanding of this area. This study highlights important ways to improve respiratory therapy education and early professional practice. It shows that mentorship, real-world preparation, communication, and teamwork are essential for training skilled and resilient practitioners. Educational programs should take a broad approach to include these aspects. Simulation-based training is helpful too, but it needs continuous updates to better connect classroom learning with the unpredictable situations in clinical settings.

In this study, mentorship and guidance revealed two key themes: skill acquisition and confidence building, and program evaluation and support. These themes offered insights into how early career respiratory therapists were able to gain the abilities and self-assurance needed to practice after passing their clinical simulation examinations. The skill acquisition and

confidence-building theme demonstrated how participants employed a range of learning techniques, including songs, acronyms, and flashcards, when practicing various procedures during their simulations, as reported by Participants 4, 6, and 9. This supports the information processing theory, where Miller (1994) pointed out that information is encoded by the brain through various channels for easy storage and retrieval. Ogradnick et al. (2020) show that simulation-based training is effective for acquiring the knowledge and skills needed for exams. The participants' narratives also emphasized how involvement in practical scenarios enriched the contents and deepened their retention of lessons and skills, as noted by Participants 1 and 8. This is consistent with prior studies that reveal that simulation-based training improves memory and cognitive functions in medical education (Li et al., 2023).

The program evaluation and support theme highlighted the importance of support from experienced clinicians and instructors as participants entered the workforce. Blue et al. (2018) indicated that using simulation settings made students feel safe while they learned and practiced new skills and techniques. In this study, Participants 2 and 4 described the step-by-step support they received, which helped build their confidence and comfort in performing tasks as part of an interdisciplinary team. This is in line with the information processing theory that suggests that the learning environment plays a significant role in contributing to information encoding and storage process (Loc et al., 2019). Participants 2 and 7 also recognized that some aspects of simulation practices are not helpful in getting them ready for professional practice. Such findings call for more harmonious teaching and learning practices that engage simulation training with real clinical experience (Durmaz Edeer & Sarikaya, 2018).

The finding of mentorship and guidance enhances skill acquisition, responds to the study's problem and purpose by identifying the factors that contributed to early career

respiratory therapists' readiness for practice in the workforce after their training in an academic institution. The themes correspond to the areas of skill enhancement, confidence, and support as the necessary components for the transition process, which is in line with the theoretical framework of respiratory therapy education and the information processing theory (Miller, 1994; Shevade et al., 2021; Yanes & Nastars, 2022). Ladendorf et al. (2019) emphasized that while simulations can provide valuable opportunities for practice, they often fall short of replicating the complexities and nuances of actual clinical experiences. Similarly, this study showed that simulation practices in respiratory therapy cannot effectively mimic actual clinical experiences, implying that a more expansive pedagogy is required to train students for practice. Another limitation that may have affected the study is that participants could have had an attitude toward the simulation activities as being either positive or negative. Also, the participants were selected based on their educational levels, which might have had an influence on their understanding and readiness for joining the labor market. Further studies should be conducted to examine the influence of educational levels on early-career respiratory therapists' transition process.

The results derived from the first research question have important implications for respiratory therapy education and the professional development of new-generation workers. Such methods as role modeling, reinforcement, and positive reinforcement can also be adopted to enhance simulation-based training and mentorship. If the existing limitations of simulation practices are considered and resolved, educational institutions and organizations in the healthcare industry can equip respiratory therapy students with the skills they need to face the clinical world, thus improving the quality of patient care and ensuring the sustainability of early careerists.

The findings of effective communication and teamwork in patient care revealed two key themes: communication and collaboration in practice, and supportive simulation practices and feedback. These themes offer an understanding that simulation practices impacted the effectiveness of the participants in terms of working independently as members of a team with support from other fields. Shevade et al. (2021) and Yanes and Nastars (2022) emphasize the importance of team dynamics and communication. The communication and collaboration in practice theme stressed the importance of communication skills for early-career respiratory therapists. As highlighted by Participants 2, 6, and 8, communication was a key component of practice development towards independence. This resonates with the information processing theory that posits that the way of thinking plays a critical role in absorbing knowledge (Miller, 1994). Interdisciplinary team members ensure that they communicate well to present information for cognition that shapes the knowledge-construction process among learners (Loc et al., 2019). Participants 3 and 11 also mentioned cooperation extensively, as they depend on their colleagues in case they come across tasks that they do not understand. Such positive interactions supported the claims of prior studies. This establishes that shared work enhances the discoverability of ideas among students and helps them to improve their learning by enhancing their knowledge encoding (Loc et al., 2019; Miller, 1994).

The supportive simulation practices and feedback theme demonstrated that participants were prepared by clinicians to work independently, having emulated the practices and feedback received during simulation. Some uniquely captured the essence of repetitive practice, where skills are honed through practice, as indicated by Participant 6 when giving an account of using the ventilator. This conclusion coincides with the assertions made by the information processing theory, which states that the course of rehearsal and repetition is necessary to transfer the

information to the long-term knowledge pool (Sanongdej et al., 2021; Stout & Klett, 2020). Other aspects underlined by participants include the importance of protocols and feedback, as stated by Participants 2 and 4. According to the information processing theory, this result implies that the simulation practices created an enhanced learning context that enabled information encoding and retrieval. However, the participants' preparedness was also identified to have some drawbacks, such as the lack of knowledge and experience in communicating with patients and giving feedback, as shown in the case of Participant 11. This result implies that although the simulation practices that were employed were generally constructive, there were areas that were not fully incorporated into preparing study participants for clinical practice, as identified in other studies (Davis et al., 2022; Durmaz Edeer & Sarikaya, 2018).

The finding of effective communication and teamwork is important in patient care; it responds to the study's problem and purpose by exploring how the simulation experience impacted the development of early career respiratory therapists to work independently in different teams with non-respiratory health professionals. The themes are focused on communication, collaboration, repetition, and feedback for independent practice in line with the information processing theory by Miller (1994) and the literature on respiratory therapy education (Shevade et al., 2021; Yanes & Nastars, 2022). However, the themes also suggest that the student may overlook certain aspects in preparing students for clinical practice, highlighting the potential need for a more comprehensive development of the respiratory therapist. There is also the issue of balance, where the educational levels differed among the participants and may have influenced how the results were interpreted. Those with a higher level of education may have come across or observed different aspects of the factors that supported or hindered their preparedness to work independently.

Further qualitative research should focus on the effects of educational background on the perception of simulation practices and early career respiratory therapists' experiences in entering the workforce. It is pertinent to note the implications of the findings for the second research question. Understanding the benefits of communication and collaborative processes can help to design more effective future models of simulation-based training that involve the fundamentals of these crucial skills. Equally important, the expectations for significant gains through repetitive practice, feedback, and protocol identification imply that respiratory therapy education programs should commit to sophisticated simulation-based training that is as realistic as possible. It is crucial for educational institutions and healthcare organizations to address these limitations to equip early-career respiratory therapists to work independently to improve patient care outcomes and to sustain the career paths of these professionals.

Focusing on emotional factors impacting exam preparedness concerning the third research question, the early career respiratory therapists yielded a satisfactory level of readiness to engage with the credentialing examinations, as well as some challenges and barriers. Consistent with what was postulated in the information processing theory by Miller (1994), most participants identified their learning and rehearsal undertakings from the simulation practices conducted when pursuing respiratory care programs. As in previous studies, participants stated that simulation practices assist in developing and maintaining the knowledge and skills required for passing the credentialing exams (Ogrodnick et al., 2020). During the simulation activities and written exams, the participants had to recover the stored information, therefore enhancing its retrieval from long-term memory (Krishnamoorthy et al., 2021; Sanongdej et al., 2021). In line with the information processing theory, the diffusion between the simulation setting and the

actual examination fostered memory recall for the participants, as asserted by Krishnamoorthy et al. (2021).

The participants also pointed out that simulation practices familiarized them with the format and content of the credentialing examinations, thus mitigating their fear and boosting their preparedness towards the examination. This finding is in line with the previous studies that have indicated that simulation-based training improves learners' self-efficacy and decreases their test-related stress and anxiety (Blue et al., 2018; Hazwani et al., 2021). The participants were able to practice the methods they would have used while undergoing the actual credentialing examination, and this allowed them to handle the cognitive and emotional aspects of the examination more effectively, as they had been put through rehearsals that were as real as the actual exams. Nevertheless, the participants also faced certain difficulties and limitations in preparing for and passing the credentialing exams. Some of the challenges mentioned included the poor wording of questions on the examinations, a lack of test centers, and the long distances to travel to the few available testing centers. These results align with the research conducted, pointing to the fact that practical challenges and the complexity of exam questions stemming from the novelty of the questions can lead to poor performance, even among well-prepared learners (Durmaz Edeer & Sarikaya, 2018; Ladendorf et al., 2019).

One factor that may have influenced the interpretation of the results is the varying levels of educational background among the participants. The participants in the study were respiratory therapists with varying levels of education, including associate degrees, bachelor's degrees, and even master's degrees. These different educational levels may have resulted in different experiences and perceptions of readiness for the credentialing examination. People with a higher degree might have more resources, training, and support available to them when compared to

those who only have an associate's degree. This difference could have affected their attitude toward simulation practices and their overall preparedness for the simulation session. Future research should examine the relationship between educational level and credentialing examination preparation in early-career respiratory therapists. A second factor that might have influenced the interpretation of the results was the small sample size. This study included 11 early-career respiratory therapists. However, if this small sample does not adequately represent the entire population, the results may not be applicable in other contexts. Also, the demographic and professional background of the respiratory therapists could impact the results. For example, participants from diverse regions or institutions might have had different educational experiences and workplace environments, leading to varied perspectives. Another factor was self-reporting bias. This study relied on self-reported data from participants regarding their perceptions of readiness; there might have been biases, such as overconfidence or underestimation of their skills and preparedness. Also, different clinical simulation experiences might have affected participants' preparedness. The quality and content of these simulations can vary across programs. Participants who went through more detailed simulations may have reported different results than those who had less training.

The most significant positive implication of this study's findings is the potential to enhance the quality of respiratory therapy education and improve outcomes for early career professionals. The enhancement of education will help educational institutions, specifically in formulating ways to make simulation practices more effective and relevant. The formulation of better simulation practices could result in more skilled graduates with more confidence in passing the credentialing examinations on their first attempt. This study indicates that although effective simulation practices were employed in the preparatory process to enhance participants'

capacity to undertake the credentialing examinations, there are some areas that require further attention in relation to the format and administration of the assessments. Addressing the factors that affect cognitive load may require program designers and educators to expand further on the relationship between simulation activities and actual examination situations, which could involve the use of more challenging and realistic problems in the practices (Durmaz Edeer & Sarikaya, 2018; Ladendorf et al., 2019). Equal access for all candidates requires addressing logistical challenges like expanding the number of testing facilities.

Recommendations for Practice

The results of this study highlight several practices that can be helpful in improving preparation for entering the professional practice of early-career respiratory therapists. One of the recommendations includes enhancing mentorship programs that focus on transitioning to workforce readiness. Potential issues surrounding early-career respiratory therapists include challenges in moving from academic programs to independent practice. Mentorship was a subject that most participants raised as the reason behind their confidence and early career achievements. This result highlights the need for well-established mentorship relationships with formal and systematically organized schedules and procedures. Mentorship should extend beyond spontaneous guidance to include predetermined collaborations between newly graduated employees and experienced respiratory therapists, as well as weekly meetings to analyze clinical cases and decision-making processes for handling complex cases. Effective role models can help guide new early career professionals by providing examples of professional behavior, decision-making, and coping strategies in real-world situations (Rozario et al., 2025). To get the best out of such programs, institutions must ensure that they allocate funds towards training mentors on

encouraging learners and providing them with constructive feedback to help them adjust emotionally.

The second recommendation is to enhance simulation activities that focus on interdisciplinary team collaboration. Based on the findings, effective communication and teamwork are crucial to delivering better patient care. Participants noted that good communication and collaboration among different clinicians greatly enhanced patient care. It also helped boost their confidence in clinical skills. Participants often mentioned how well they work together with other team members from different areas. To counter this, educational institutions should ensure that they include more experiential-based exercises that model the aspect of teamwork in interdisciplinary teams. The incorporation of team-based simulation scenarios ensures that students have an opportunity to solve problems and work in environments similar to those found in actual healthcare organizations. Patel et al. (2025) emphasized the importance of interprofessional collaboration as a response to the growing complexity in healthcare environments. Therefore, cultivating these competencies during the early stages of respiratory therapy programs allows graduates to prepare for the existing collaborative clinical practice environment.

Finally, training on emotional preparedness and patient communication should be considered. The results of this study established the kinds of emotional difficulties faced by early-career respiratory therapists. Participants emphasized the importance of training respiratory therapists in emotional coping and communication skills. Several of the participants narrated having to deal with anxiety when handling multifaceted problems and patients' sensitive issues. Training programs should, therefore, include modules on stress management and stress as a possible area for further development of personal emotional intelligence, as well as an

understanding of how to convey bad news to patients and their families. Stress preparedness is crucial not only to the personal well-being of respiratory therapists but also to the quality of patient care they provide. This conclusion is supported by prior research, such as that of Falade et al. (2025) and Machado et al. (2025), who found that emotional intelligence plays a significant role in both academic and professional settings. Falade et al. (2025) highlighted that students who showed high emotional intelligence, characterized by self-awareness, empathy, and interpersonal skills, tend to achieve better academic performance (Falade et al., 2025). The researchers emphasized the importance of family support in enhancing students' motivation and resilience, contributing to a positive learning environment and better educational outcomes (Falade et al., 2025). In addition, Machado et al. (2025) found that nurses with emotional intelligence skills foster more optimistic patient care relationships, which in turn lead to improved medical practices and better patient outcomes (Machado et al., 2025). Enriching respiratory therapy curricula with components that focus on emotions and communication will help close this gap and adequately prepare graduates for the emotional demands of the job.

Recommendations for Future Research

The following recommendations are based on the findings of this study and suggest directions for future research. To guide the understanding of how early-career respiratory therapists process, retain, and apply knowledge during the transition phase from the academic to the professional practice setting, this study relied on Miller's (1994) information processing theory. Thus, this framework successfully explains cognitive and practical learning processes; however, future research can apply the frameworks of adult learning theory or the theory of transformative learning to consider the affective and experiential dimensions of workforce readiness. If future researchers consider the variables contributing to knowledge about early-

career respiratory therapists, understanding how the practices of reflective practice or transformative learning affect them could present a different and more complete perspective on their preparedness.

The target population for this study was respiratory therapists with up to three years of clinical experience in practice across various institutions. Therefore, future research should include a larger number of participants with a greater geographical dispersion to increase the likelihood and extent of generalizability of the findings. Furthermore, involving participants from other countries may help compare how various healthcare systems and educational frameworks affect preparedness. Additionally, this study captures only a snapshot of early-career experiences. Therefore, future research may utilize a longitudinal approach where participants are followed through their first five years of practice to evaluate the sustained effectiveness of clinical simulations, mentorship, and emotional preparedness training. A long-term approach would help explain whether such outcomes are sustainable in the long run.

Emotional preparedness was found to be a significant construct in the process of transitioning to practice; however, it remains an under-researched topic. Therefore, issues that need to be addressed in future studies concern how specific interventions, such as resilience-building workshops, peer support groups, and stress management programs, affect the therapists' psychological and emotional state. These investigations could use mixed methods, integrating qualitative data with quantitative indices of pressure, emotional exhaustion, and appreciation for work. In addition, as the healthcare field progresses, more research should be directed toward incorporating the utilization of virtual and augmented reality into simulation-based training and education paradigms. Subsequent research could focus on the impacts of these tools on the

development of skills and coordination between professions in respiratory care training and curriculum.

The next phase in this field's research is to design and test interventions that address the gaps in workforce preparedness. Through the use of various methods and theories, the researchers can contribute empirical findings to enhance the teaching and practice of respiratory therapy, including additional types of research with long-term monitoring, various patient groups, and emerging technologies, which will contribute to a broader perspective on the best preparation for respiratory therapists in the early stages of their careers. Such measures may also help to improve the quality of patient treatment and increase the level of satisfaction among respiratory therapists.

Conclusions

This qualitative case study examined the experiences and perspectives of early-career respiratory therapists regarding their transition from academic settings, through written and clinical simulation examinations, into their initial years of practice. The study aimed to fill the knowledge gap on unprepared respiratory therapists in the first few years of practice and its consequences on their competence and self-confidence. The researcher sought to find factors related to workforce preparedness, with a special emphasis on simulation activities, supervision, and team collaboration. Utilizing semi-structured interviews with participants in their first three years of practice, six key themes were identified: skill acquisition and confidence building, program evaluation and support, communication, and collaboration in practice, supportive simulation practices and feedback, exam preparedness and support, and exam challenges and emotional responses.

The results of the study emphasized the need for educational and professional preparation to ensure that respiratory therapists go into professional practice with the necessary skills and knowledge that would enable them to practice without much difficulty. Simulation practices, preceptorship, and experiences involving collaboration with other disciplines were considered crucial in readiness. These findings help advance knowledge in the field by addressing a gap in understanding the interpolated experiences of respiratory therapists as they encounter the challenges associated with early practice, in light of the increasing pressures placed on healthcare systems and the dynamic nature of clinical settings.

Consequently, the findings of this study highlight the importance of incorporating educational practices that reflect real-life clinical settings in the pursuit of clinical knowledge. The findings indicate that simulation-based education fosters practical competencies effectively while, at the same time, drawing attention to its capacity for creating realistic conditions wholly. The literature review revealed that mentorship has become a significant attribute in closing the gap between knowledge and its implementation, highlighting the need to establish effective and accessible programs on mentorship. Furthermore, the study results demonstrated that interdisciplinary collaboration training enhances teamwork, a crucial aspect of contemporary organizations, particularly in healthcare services. One of the emerging topics acknowledged a lack of focus on emotional preparedness, even in highly technical fields, which may cause anxiety and burnout.

Based on the findings of this study, a more systematic approach is needed when training respiratory therapists for clinical practice, as technical skills alone are insufficient; interpersonal and emotional skills are also needed. Teachers and healthcare institutions should use well-developed simulation activities, interprofessional scenario practice, and effective knowledge

transfer models. These measures can prepare respiratory therapists for the complex tasks involved in clinical practice, thereby enhancing the quality of care provided to patients and the level of satisfaction among professionals. As such, the results of this study offer input to the discussion on elaborative educational changes required in healthcare training institutions.

Subsequent studies should elaborate on these findings to design and evaluate new interventions that address the aforementioned gaps, thereby enabling early-career respiratory therapists to better prepare for the challenges of practice and enhance the delivery of patient care.

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Appendix A

Questionnaire for Preselection and Recruitment of Participants

1. Are you a respiratory therapist who has transitioned into the work environment within the past three years?

Yes

No
2. Do you currently work, or have you previously worked as a respiratory therapist in a healthcare setting?

Yes

No
3. Have you completed an accredited respiratory care program within the United States?

Yes

No
4. Did you receive at least an associate's degree from a respiratory care program?

Yes

No
5. Have you undergone written and clinical simulation examinations related to respiratory training before practicing in the work environment?

Yes

No

Appendix B

Interview Questions

Introduction

Hello, my name is Dan Brown. I am a doctoral candidate at National University conducting research for my dissertation. The title of my dissertation is “Early Career Respiratory Therapist Perceptions of Their Readiness to Work Independently After Completing Clinical Simulation Practices in a Respiratory Care Program.” I am a registered respiratory therapist and have practiced for 30 years in various settings. First, thank you for agreeing to participate in this research study with today’s interview. This interview is expected to last approximately 30-45 minutes and will be recorded in reference to this study with your consent. During the interview, I will ask questions regarding your educational and transition experiences from the academic setting into the workplace. All information from this interview is and will remain confidential, and you may stop the interview at any time without repercussions. This research will help to understand matters associated with transitioning from the academic setting to the work environment.

Interdisciplinary Preparedness

RQ1

What are early career respiratory therapists' perspectives regarding their skills in working with interdisciplinary preparedness to transition into the workforce after completing the clinical simulation examinations?

1. Please tell me about your educational journey throughout the respiratory care program and the position you are now in.

- (a) What were your most memorable learning activities in simulation practices?
- (b) During simulation practices, what made the techniques that you now use in everyday practice difficult and easy to remember?
- (c) Please describe what you consider the most challenging and supportive requirements for working on an interdisciplinary team.
- (d) How have clinical simulation examinations given insight into what to expect as part of an interdisciplinary team after entering the workforce?
- (e) Please describe your confidence level after completing simulation practices regarding performing tasks as part of an interdisciplinary team.
- (f) How would you describe the level of eagerness and hesitation you encountered when completing a task while working with an interdisciplinary team as an early-career respiratory therapist?
- (g) What specific tasks do you commonly use in everyday practice that you can connect to simulation practices based on what you have learned and remembered during the program?

Work Independently/ Simulation Practices

RQ2

What do early career respiratory therapists perceive as factors of the simulation practices that facilitated or interfered with preparedness to work independently when entering the workforce, particularly within interdisciplinary teams?

2. Please describe how simulation practices influenced your abilities to communicate with others within an interdisciplinary team regarding the healthcare needs of patients.
 - (a) How would you describe the level of guidance that you received from simulation practices to prepare you to work independently?
 - (b) Please describe the strengths and weaknesses of factors within simulation practices that influenced preparedness to work independently and how.
 - (c) How would you describe your experience encountering unfamiliar tasks as part of an interdisciplinary team?
 - (d) How have simulation practices helped you to remember communication techniques relating to the interdisciplinary team and patients?
 - (e) Please describe what you believe to be the most important parts of simulation practices regarding your preparation for entering the workforce.

Credentialing Examinations

RQ3

What are early-career respiratory therapists' perspectives regarding preparedness to approach the credentialing examinations?

3. Please tell me about your experiences with the credentialing examinations.
 - (a) Please describe your level of preparedness when you took the credentialing examinations.
 - (b) What were your greatest supports and challenges when taking the credentialing examinations?

- (c) What supports and barriers did you encounter when preparing for the credentialing examinations?
- (d) Please describe the influences you believe simulation practices have on preparedness to approach credentialing examinations.
- (e) Please explain how learning and remembering activities throughout the program, using simulation practices, have prepared you for the credentialing examination.

Appendix C

Participant's Educational Background

Table 1

Summary of Participants' Educational Background and Experience in Healthcare Settings

Participant	Educational Background	Years of Experience	Healthcare Setting
Participant 1	Inner Service Program	8 months	Hospital
Participant 2	Bachelor's in Allied Health	3 years	Hospital
Participant 3	Associates Degree	3 months	Hospital
Participant 4	Bachelor's in Sociology	3 years	Outpatient
Participant 5	Associates Degree	2 years	Hospital
Participant 6	Master's Degree in Respiratory	1 year	Rehabilitation
Participant 7	Associates Degree	1 year	Hospital
Participant 8	Bachelor's in Applied Science	3 years	Rehabilitation
Participant 9	Bachelor's in Respiratory Therapy	2 years	Outpatient
Participant 10	Bachelor's in Liberal Arts	1 year	Hospital
Participant 11	Associates Degree	3 years	Outpatient

Appendix D

Code Table

Table 2

Codes, Categories, and Themes

Codes	Categories	Themes	
Being Able to Memorize the Procedures	Memorization techniques	Theme 1: Skill Acquisition and Confidence Building	
Confidence builds over time. Getting Hands-on Experiences	Hands-on experience		
Group work did not do well in preparing RTs	Gradual confidence development		
Implementing Learned skills in patients			
Techniques that helped in memorizing			
Training RTs on Handling Home Care			
Training the Right Skills			
Guidance offered by Career Experts	Quality of instruction		Theme 2: Program Evaluation and Support
Poor Delivery of the Program Content	Support from career experts		
Regular Competency Training	Relevance of training components		
Some Things do not correlate with what was Learnt in Class.			
Training on Soft Skills		Theme 3: Communication and Collaboration in Practice	
Advocating for the Patient	Patients' advocacy		
Asking for Help in case of Unfamiliarity	Navigating Interpersonal Dynamics		
Communication as a Barrier			
Learning How to Communicate Well	Seeking support and guidance		
Co-worker Assistance in case of Need			

Working with Different People		
Difficult Working with Different People Every Day		
Constant Simulation Practices	Repetitive practice and skill reinforcement	Theme 4: Supportive Simulation Practices and Feedback
Getting Feedback Protocols acted as a Supportive Aspect.	Constructive feedback mechanisms	
Treating All Patients the Same Way		
Working with Different People	Guiding protocols and procedures	
Students felt they were prepared to do the Exams	Utilization of resources	Theme 5: Exam Preparedness and Support
Getting Access to Learning Resources	Peer collaboration	
Getting Family and Friends' Support during the Exam Period	Family and friends support	
Simulations Helped to Prepare Students for Exams		
Preparing for Exams with Other Students		
Teachers Sharing Their Experiences with the Exam		
Doing Several Tests before the Exam Helped	Understanding exam format	Theme 6: Exam Challenges and Emotional Responses
Exams are Scenario Based	Anxiety and stress management	
Feeling Nervous While Taking the Exams		
A limited number of Testing Centers	Logistical barriers	
Difficult-to-Understand Exam Questions		

Note. Table showing codes, categories, and themes.

Appendix E

Key Findings

Table 3

Key Findings of the Research

Research Question	Key Findings
1. Interdisciplinary Preparedness	<ul style="list-style-type: none"> - Hands-on experiences and memorization techniques enhanced skill acquisition and confidence. - Practical training was crucial for workforce readiness. - Guidance from experienced clinicians was essential for navigating complex clinical situations. - Real-world scenarios often differed from classroom teachings, indicating a need for ongoing support.
2. Simulation Practices	<ul style="list-style-type: none"> - Effective communication and collaboration were vital for working with interdisciplinary teams. - Supportive simulation practices and feedback built confidence in clinical skills. - Limited experience in patient interactions and emotional communication posed challenges.
3. Preparedness for Credentialing Examinations	<ul style="list-style-type: none"> - Participants felt well-prepared due to effective teaching and supportive study environments. - Emotional support from family and friends reinforced confidence. - Anxiety and logistical challenges, like limited testing centers, impacted the examination experience.