DETERMINING THE RELATIONSHIP BETWEEN FIRST TIME THERAPIST MULTIPLE

CHOICE EXAM HIGH CUT AND CLINICAL SIMULATION EXAM PASS RATES OF

RECENT RESPIRATORY THERAPY GRADUATES FROM AN OHIO UNIVERSITY AND

THEIR WELL-BEING AND PERSISTENCE

by

Rebecca Elizabeth Fox

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Philosophy

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APPROVED BY:

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ABSTRACT

A recent trend in health care education, especially in respiratory therapy (RT), is the decline of applications to undergraduate programs. With the aging population and projected increase in health care costs, the future RT workforce will need to be strong and increase by 23% in the next 10 years. With applications to RT programs down 42%, recruitment has become an issue of utmost importance. The purpose of this research is to determine the relationship between first time Therapist Multiple Choice (TMC) exam high cut and Clinical Simulation Exam (CSE) pass rates of recent respiratory therapy graduates from an Ohio university and their self-efficacy and persistence. Additionally, this study seeks to identify current recruitment strategies in higher education, health science and RT education and develop a framework for future recruitment to the field. Results show that with 85% accuracy, high levels of persistence will predict credentialing exam success on the first attempt. There is a statistically significant positive predictive relationship between level of persistence and TMC high cut and CSE first time pass rates ($p=0.17$). Current strategies noted were exploration courses, involvement fairs, reputation, and personal faculty representation. A future RT framework should include positive experiences with faculty and alumni and digital platforms and courses highlighting RT program achievements.

Keywords: *Respiratory Therapy, Education, Recruitment, Self-efficacy, Persistence*

Copyright Page (Optional)

Dedication (Optional)

This dissertation is dedicated to my daughters Vivian and Ashlynn. You have given me so much purpose in life and helped to motivate me to be the best in life. Thank you for pushing me to be the best mom and student. I hope that by watching me succeed, you realized you can do anything you want and I will always be behind you cheering you on.

Acknowledgments (Optional)

I would like to thank my mentor Dr. Sarah Varekojis for helping push me to this point in my career and supporting me when I wanted to give up. I would also like to thank Dr. Georgianna Sergakis for her support and pushing me to pursue my PhD. You have both set me up for success in life and I couldn't be more grateful. Finally, I would like to thank my chair Dr. Treg Hopkins for supporting me through this process and ensuring I made it to the finish line.

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List of Abbreviations

American Association of Respiratory Care (AARC)

Career Decision Self-Efficacy Scale Short Form (CDSE-SF)

Certified Respiratory Therapist (CRT)

Clinical Simulation Exam (CSE)

College Persistence Questionnaire- Version 3 Short Form (CPQ-V3)

Commission on the Accreditation of Respiratory Care (CoARC)

Respiratory Therapy (RT)

Registered Respiratory Therapist (RRT)

Therapist Multiple Choice exam (TMC)

CHAPTER ONE: INTRODUCTION

Overview

The purpose of this quantitative, correlational study is to discover if there is a relationship between first time Therapist Multiple Choice (TMC) exam high cut and clinical simulation exam (CSE) pass rates of recent RT students at an Ohio university and their well-being and persistence, providing a base for a recruitment framework in RT education. Included in the background is an overview of the theoretical framework for this study. The problem statement examines the scope of the recent literature on this topic. The purpose of this study is followed by the significance of the current study. Finally, the research questions are introduced, and definitions pertinent to this study provided.

Background

In previous years, there has been a noticeable decrease in applicants to higher education, including to the various undergraduate health science professions. Specifically in respiratory therapy, the annual report from the Commission on Accreditation for Respiratory Care (CoARC) shows a 42% decline in applications, most recently assessed from 2011 to 2016 (CoARC, 2018). This decline in applicants places the profession in a dire situation, as health care needs are projected to increase as the Baby Boomers age, retire, and require healthcare. Additionally, with the current global COVID-19 pandemic, health care professionals are becoming increasingly important in order to treat and manage those affected by the virus. The projected future needs of the healthcare work force have made it increasingly important for respiratory therapy (RT) educators and programs to recruit and retain quality applicants of various diverse backgrounds.

Strategies have been developed to recruit into higher education, as well as the variety of health science professional programs. However, there are not strategies specific to recruitment

and retention in RT - a profession that is not as widely known as nursing, physical therapy, occupational therapy, etc. The existing strategies have the potential to be tailored to the needs of a specific profession, institution or academic program. Hsueh (2018), Hisel and Pinion (2020) and Kalimullin & Dobrotvorskaya (2016) highlighted various strategies for recruitment in higher education. Hsueh (2018) described the importance of technology, especially when recruiting internationally. Social media and virtual tours allow academic institutions and potentially specific professional programs to maximize their reach and successfully recruit students in a familiar platform. Hisel and Pinion (2020) supported this, especially during the current COVID-19 pandemic. They noted the importance of social media and, specifically, the importance of individual academic programs developing their own social media accounts, rather than relying on the university account. Social media is a creative way to reach perspective students and develop relationships during difficult times. Kalimullin & Dobrotvorskaya (2016) noted the importance of highlighting quality when recruiting in higher education. They described how students are more likely to choose schools with quality equipment, training facilities, resources and available dorms. Also, student perception of the quality of education is a major factor in decision-making processes.

As global access continues to expand, international students have also become both eligible and desirable for recruitment. 72 percent of reporting United States universities admitted an increase in internationalization in recent years (Anonymous, 2017). International student recruitment does not only rely on academic rankings of the institution, noting the importance of other outside factors that can influence their decision (James-MacEachren, 2018). Additionally, James-MacEachren (2018) noted the importance of differentiating one's program from others, as often academic advertising is similar and blends together. As countries actively compete in what

is known as the "great brain race," the importance of international recruitment continues to grow (Sá & Sabzalieva, 2018, p 232). In order to attract the attention of an international student, it is suggested that one should remain flexible, adjusting strategy and resources to meet the institutions recruitment goals. Additionally, Sá and Sabzalieva (2018) recognized the importance of public policy when recruiting internationally, comparing various countries and the current and future prospects they provide for international students. Anonymous (2017) also noted an increase in budgets specific to international recruitment, as universities strive to diversify and prepare students for globalization.

Additional strategies, specific to health science education, have been tested by Lubbe et al. (2014) and Tawash and Cowman (2018). Tawash and Cowman (2018) found that the use of nursing ambassadors was the most influential way to recruit future nursing students. The study also found that the current most commonly used strategies, booklets and videos, were the least influential way to recruit. Lubbe et al. (2014) conducted a multistage study that resulted in the development and testing of a framework for recruitment into nursing. The authors found that the framework showed positive results in nursing recruitment and found that the framework could likely be customized for other health professions as well. The framework requires further research in other fields, however, shows promise as a potential recruitment plan in all health sciences.

When recruiting into any academic program, it is critical to consider the diversity of the student population. Diversity reveals issues across the various races, socioeconomic statuses and cultures. Ensuring a diverse student population also allows the profession to span all areas and all settings of health care, as many students return home after graduation, or to a community that is similar in nature. Wallace et al. (2015) and Mitchell (2014) investigated the effectiveness of

programs tailored to underprivileged students in recruiting to the field of nursing. Both studies showed that the programs were beneficial in the recruitment of these students because they provided the necessary exposure and supports. It was also suggested that additional research utilizing these types of programs be conducted to continue recruiting to the health science and medical professions. Both programs' studies exposed students to various aspects of the professions and have required components that ultimately result in increased awareness and interest. Additionally, Mosholder et al. (2016) discussed the importance of effective communication, community, mentoring and scholarship when recruiting to an institution. They also discussed the importance of culture and cited the Funds of Knowledge Theory, as a resource when attempting to recruit Native American students or any other ethnicity. The Funds of Knowledge Theory states that students do not solely gain knowledge in educational environments, they also develop knowledge at home and in their communities (Moll, 1992). Taking into consideration the established recruitment strategies specific to diversity, coupled with strategies that have been considered successful in higher education and other health science professions, gives potential to the development or tailoring of strategies aimed at recruiting in RT education. James and Derrick (2020) supported this notion as well, stating that as student recruitment practices evolve and change, recruitment of international students must consider the culture of the target and consider factors that will impact them.

The funds of knowledge theory can be applied to recruitment and retention in RT education. This theory was developed by Gonzales, Moll and Armanti in 1992 and they have continued to publish about the theory and its applications ever since. Knowing a student's knowledge base allows educators the opportunity to build on that base in an education setting and develop his or her skills for the future. Additionally, understanding students culturally allows

an educator to develop specific activities that might intrigue and engage the students' interests in the career of respiratory therapy. In health care, it is important to recruit diverse groups of students from all aspects of life. When the health care team can relate to the patients, it allows for better outcomes and attention to details that might otherwise be ignored. There are the obvious language barriers that can potentially exist, but sometimes something as simple as knowing who to address can make the most difference to a family who's loved one hospitalized. Additionally, there are many health care professionals that return to a familiar environment and have a vested interest in the health care of their community.

Problem Statement

There is a gap in research literature with regard to addressing the issue of declining applications and recruitment in RT education. There has been significant research into recruitment and retention strategies for higher education and the health science professions (Hsueh, 2018; Kalimullin & Dobrotvorskaya, 2016; Tawash & Cowman, 2018 and Lubbe et al., 2014). However, this research is generalized to higher education as a whole and not specific to the field of RT. As a profession, RT and RT education are in a unique position competing with some of the better-known professions such as nursing and medicine. Literature has provided frameworks and strategies to help with general recruitment and recruitment into nursing and other health fields, however, the literature lacks generalizability to other, smaller and lesser-known professions. Additionally, Tawash and Cowman (2018) described recruitment strategies specific to nursing but no other health professions. While nursing and other health professions such as RT are similar to one another, there are major differences, such as the lack of notability and public familiarity with the RT profession. Recruitment strategies that have been successful in higher education and other health professions provide a solid base, however based on CoARC

(2018) trends in RT program applications, further research is necessary to determine how to recruit to the RT profession specifically. With the projected increase in future health care needs and the current pandemic, RT is a crucial front lines health care profession (Bureau of Labor Statistics, 2019). The future of health care and the profession rely on the success of the academic programs to recruit and adequately prepare the future of the field. The problem is that there is a lack of research specific to how accurately first time TMC exam high cut and CSE pass rates can be predicted from a linear combination of Lifestyle Index factors for recent RT graduates in an Ohio university (Hsueh, 2018; Kalimullin & Dobrotvorskaya, 2016; Tawash & Cowman, 2018 and Lubbe et al., 2014).

Purpose Statement

The purpose of this quantitative, correlational study is to determine how accurately first time TMC exam high cut and clinical simulation exam pass rates can be predicted from a linear combination of Lifestyle Index factors for recent RT graduates in an Ohio university. For this study the predictor variables will be the Lifestyle Index factors, persistence and self-efficacy. The criterion variable will be the first time TMC exam high cut and clinical simulation exam pass rates, resulting in obtaining the credential of Registered Respiratory Therapist (RRT). Persistence is defined as remaining in an academic program and/or institution and is affected by many factors such as: family income, academic degree level, student involvement, academic performance, race, social integration, employment, and marital/family status (Leppel, 2002). According to Dinther et al. (2011), self-efficacy is one's beliefs in their capabilities to attain their goals and is a significant variable in student learning as it affects motivation and learning. This study population will include recent, within the last 8 years, RT student graduates at an Ohio university and will assess their persistence and well-being to determine if a relationship is

present. The population will include all 140 recent graduates, enrolled from 2014 to 2022, of the RT program. An open-ended descriptive component will be added to assess the current recruitment strategies experienced by the recent graduates. Recent graduates will be asked to share how they were recruited and encouraged to apply to the RT program at an Ohio university, helping to identify which recruitment platforms were successful, and which were not. Currently the RT program at an Ohio university has a variety of recruitment strategies being utilized, including high school counselors, college academic advisors, university hosted recruitment events and direct contact from the RT program etc. This information can then be utilized to develop a recruitment framework, focused on successful recruitment strategies and targeting potential students who are likely to be successful on post-graduation credentialling examinations.

Significance of the Study

This study is significant to the topic of RT education as related to recruitment strategies. In order to meet the future demands of health care and survive as a profession, RT will need to not only overcome general recruitment hurdles, increasing the number of practitioners entering the field, but must also overcome the overall lack of public knowledge about the profession. RT educational programs require specific recruitment strategies to inform the public of the professional existence, encourage qualified individuals to apply, and retain applicants that may be considering alternative options in other, better known health professions. Smith et al. (2017) surveyed members of the New York State Society of Respiratory Care in order to describe the future role of the RT. It was found that strong, highly prepared RTs will be needed to maintain the workforce. Additionally, Smith et al. (2017) note that RT will need to expand into all settings of health care to remain competitive. Nationally, the decline in applications indicates a pattern that, if not addressed, will limit the ability of the profession to expand. Positive attitudes

combined with proper education, nationally, can help create the appropriate future RT workforce.

Gusmano & Allin (2014) investigated rising health care costs in three different countries and attempted to determine the root cause. In all three countries, the aging population was the most commonly referenced cause of increased cost, although, one must note that many of the periodicals reviewed by the authors were obviously influenced by political affiliations. It was summarized, that globally, in the future, there will be an increased need for health care. Increased costs are associated with health care due to the aging population. With the growing age of the population, there is expected to be a 23% increase in RT jobs over the next 10 years (Bureau of Labor Statistics, 2019). Issues associated with an aging population not only contribute to an increase in patient numbers but also a decrease in staffing due to the retirement of the current RT workforce. With the 23% projected increase and the retirement of current RTs in the workforce, it is crucial for recruitment strategies specific to RT education to ensure this need and future needs can be realized.

In addition to the projected job growth over the next decade, the current global pandemic solidifies the need for health professions, including RT. The demand on health care is rapidly changing as a result of the pandemic, once again making the recruitment of future health professionals in the field of utmost importance. Hisel and Pinion (2020) recognized how the pandemic makes face-to-face recruitment more complicated but allows for strategies such as utilizing social media to thrive. Additionally, they recognized the cost effectiveness of digital platforms that allow academic programs to reach a multitude of students with little time and cost investment. Frandsen, et al. (2016) also supported the cost effectiveness of social media advertising also noting the ability to target isolated or populations of color that would otherwise

be difficult to recruit. Whether one is recruiting to an academic program or research study, the key is targeting the audience in ways to which they can relate, which, in today's society, includes digital platforms and social media.

Determination of the existence or absences of relationship between persistence and well-being and first time TMC exam high cut and CSE success of recent graduates from a RT program provides educators with important information in regard to recruitment and retention in the field of RT education. Immediately following completion of the program, RT graduates are eligible to complete the TMC exam which has a high and low-cut score for students to achieve, each cut resulting in a different outcome. Achieving the low-cut score earns the graduate the credential of Certified Respiratory Therapist (CRT), a credential which, as of 2018, will not grant the graduate eligibility to obtain a license to practice respiratory care in the state of Ohio. Achieving the high-cut score earns the graduate the opportunity to continue their board examinations and sit for the clinical simulation exam. Passing of the TMC exam at a high cut score and subsequent passing of the clinical simulation exam earns the RT graduate the credential of RRT and allows them to apply for a license to practice in the state of Ohio (State of Ohio, 2020; The National Board for Respiratory Care, 2022).

The AARC (2017) encourages states to require the credential of RRT to obtain RT licensure to practice. With this recent encouragement, it is crucial that RT graduates are able to pass the TMC exam with the high cut score and then subsequently pass the CSE to become an RRT. The National Board for Respiratory Care (NBRC) examination trends show a large decline in examination pass rates following the first attempt, from 71.5% to 30.1% on the TMC exam and from 67.2% to 57.8% on the clinical simulation exam (NBRC, 2021). These trends further show the importance of new graduates passing the TMC and CSE on the first try.

Additionally educational institutions are sensitive to funding changes and tend to fall victim to state and federal budget cuts (Rikowski, 2019). In times of economic crisis and global pandemics, RT programs can use the results to minimize the financial burdens of recruitment and ensure maximum success in recruitment of students that will join the licensed RT health care workforce in the future. A descriptive component of the research will examine existing strategies for recruitment in higher education and health science education and help provide a base for developing a framework specific to RT education. In future research this framework can be fully developed and subsequently tested to ensure effectiveness. Special consideration of strategies specific to diverse student populations allow for increased awareness of the profession through the development of programs that not only recruit to the profession, but also recruit underrepresented populations to the health care field of RT. Additionally, future research will be able to expand this study, and determine if other institutional types have similar relationships between recent graduates and their persistence and well-being and therefore can other institutions target students of a specific type to maximize recruitment success overall.

Research Question(s)

The research question the multiple regression will answer is:

RQ1: How accurately can first time TMC exam high cut and clinical simulation exam pass rates be predicted from a linear combination of Lifestyle Index factors for recent RT graduates in an Ohio University?

Definitions

The following key vocabulary and definitions provide a critical common understanding for the content of this study.

1. *Astin's Theory of Involvement* - Theory that states that when students have more involvement during college experiences, there is a greater likelihood of college retention (Astin, 1999).

2. *Financial resources* - Sum of the operating budget (financial expenditures for travel, laboratory supplies, books, instructional aids, and electronic media) and personnel budget (the salaries of full-time and part-time faculty members as well as support personnel in the program) (Ari, 2009).

3. *Fund's Knowledge Theory* - Theory that states that people are not blank slates, rather are influenced by and gather information about society, professions etc… from their homes and communities (Moll, et al., 1992)

4. *Holland's Career Typology Theory* - Theory that links personality traits to specific career pathways (Antony, 1998).

5. *Latane Social Impact Theory* - Any of the great variety of changes in physiological states and subjective feelings, motives and emotions, cognitions and beliefs, values and behavior, that occur in an individual, human, or animal, as a result of the real, implied or imagined presence or actions of other individuals. (Latané, 1981, p 343)

6. *Persistence* - a student's conscious choice to remain in school or accomplish academic goals (Mooring, 2016).

7. *Personnel resources* - The total number of faculty; full-time staff, full-time faculty and part-time faculty (Ari, 2009).

8. *Retention* - A measure of the rate at which students persist in their educational program at an institution, expressed as a percentage. For four-year institutions, this is the percentage of first-time bachelor's (or equivalent) degree-seeking undergraduates from the previous

fall who are again enrolled in the current fall. For all other institutions, this is the percentage of first-time degree/certificate-seeking students from the previous fall who either re-enrolled or successfully completed their program by the current fall (National Center for Education Statistics, 2021).

9. *Self-efficacy* - Self-efficacy refers to an individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments (Bandura, 1997).

10. *Student Recruitment* - The process of finding and recruiting the best-qualified students from within or outside of an institution in a timely and cost-effective manner (Vargas, 2020).

11. *Tinto's Dropout Theory* - Theory that states that students who are integrated into their educational environment are more likely to persist in their studies (Tinto, 1975)

CHAPTER TWO: LITERATURE REVIEW

Overview

A systematic review of the literature was conducted to explore the problem of recruitment and retention in respiratory therapy (RT) education. The majority of the knowledge on this subject will be presented in regard to health science education and higher education as a whole. This will highlight the gap in the literature specific to recruitment in RT education. Successful recruitment in RT education includes student attraction, application completions, offer acceptance and student retention. Theories based in persistence and influencing choice can be utilized, in conjunction with previous literature, to help develop recruitment and retention plans for the future. As health care needs evolve and the national population ages, recruitment and retention in RT education will become an important issue that needs addressed. This literature review demonstrates potential strategies and concerns with recruitment and the importance of addressing the issue before it is too late. This chapter includes a review of recent trends and issues in health science and RT education, budgeting and marketing as related to student recruitment, theories related to recruitment, and recruitment strategies in higher education and the health sciences, including RT.

Theoretical Framework

Various theories have an effect on the issue of recruitment in RT education. For example, Tinto's dropout theory theorized that student dropout is directly related to social and academic integration (Tinto, 1975). Those students, who are integrated, are more likely to persist than those who are isolated in either area. Tinto (1975) stated:

Very frequently, events in the social system external to the college can affect integration within the more limited social and academic systems of the college. But though it is recognized

that a person may withdraw from college for reasons that have little to do with his interaction within the college systems, it is suggested that those impacts will be best observed through the person's changing evaluations of his commitments to the goal of college completion and to the institution in which he is registered. (p.97)

Additionally, Astin's theory of involvement theorized that the more involvement during college experiences elicits a greater likelihood of college retention (Astin, 1999). He showed that student pride and a sense of commitment develop when students are immersed in rather than isolated from the college experience. Students from various backgrounds and with a variety of goals all demonstrated the same pattern. The greater the level of involvement, the greater the level of success (Astin, 1999). While it is clear that involvement is critical to student persistence, both theorists neglect that which motivates a student to become involved. These theories emphasized a need to create a sense of involvement when recruiting, but, more importantly, when trying to retain students. Once admitted into an academic professional program, such as RT, it should be the first priority of the program to involve the student in the program, even prior to starting his or her core course load. By creating a sense of involvement among students who have accepted a position in the program, the program is increasing their likelihood of persistence.

Latané (1981) developed the social impact theory, which would later be used to build modern theories regarding social media. Social Impact is when a real, implied or imagined presence or action causes a change in an individual's feelings, beliefs, behaviors and physiological states (Latané, 1981). He discussed the social forces that influence individuals or targets. Latané (1981) theorized that social forces produce varying levels of effect depending on the situation. For instance, distance, prestige, number of forces and gender are factors affecting

the level of influence any particular force may have on an individual. Latané (1981) theorized that the level influence experienced by an individual is related to:

- The prestige of the person or social force

- The proximity of the social force, relationship or event

- The number of individuals that make up a social force

In education, this theory can be utilized to determine appropriate techniques for professional program recruitment. Technology can reach out and close the distance gap between professional programs and potential recruits, as it is such an integral part of modern student lives. Astin, Tinto and Latané's theories can be applied to recruitment in RT education as a way involve students during the recruitment process. Encouraging student involvement, especially through social media, gives the perspective student a sense of belonging and could result in an application, commitment and future enrollment in RT curriculum.

Another important aspect of recruitment is targeting the appropriate potential future student. When designing potential recruitment activities, Holland's career typology theory and the funds knowledge theory make suggestions on how to choose the desired audience. Holland described personality traits that fit with career choices. In the field of medicine, artistic, social and investigative personality types are common (Antony, 1998). Personality testing results may provide a recruitment pool of students that a health science or medical program can target with recruitment materials. Because those targeted have the personality traits who typically advance into the medical professions, they are more likely to express interest in the recruitment materials provided to them by medical or health programs, like RT. In a similar fashion, the funds knowledge theory states that people are not blank slates, rather are influenced by and gather information about society, professions etc.… from their homes and communities (Moll, et al.,

1992). Creating recruitment activities that target students with parents that are medical or health science professionals or recruiting students who fulfill their community service requirements by volunteering in a medical institution, may result in increased applications and improved retention. Additionally, understanding students' cultural backgrounds provides valuable information which may be useful to recruitment.

<div align="center">**Related Literature**</div>

There is a gap in the literature specific to RT education and recruitment and retention. However, literature specific to higher education and health science education, as well as the financial aspects of recruitment was reviewed. Additionally, literature specific to the current health care trends and projected changes in the need for health care professionals will be discussed. Finally, literature specific to factors that influence student retention and strategies to improve retention rates will be discussed.

Recent Trends in Higher Education Enrollment

National trends project a drop between 13 and 29 percent, in the college-age population, over the next decade (Pavlov & Katsamakas, 2020). This decline in population is projected to cause "lower enrollments and operating deficits at tuition-dependent colleges. (Pavlov & Katsamakas, 2020, p.2)". According to the National Student Clearinghouse Research Center (NSCRC), in current times, a major cause of concern related to declining college enrollments is the COVID-19 pandemic (National Student Clearinghouse Research Center, 2021). The NRCRC (2021) notes that recent trends were already showing a decline in enrollment, from 20.56 million in 2012 to 18.24 million in 2020, often attributed to decline in population, but that this trend has increased since the start of the pandemic. Community colleges reported a 9.5% decline in both spring 2021 and fall 2020 enrollments, bachelor's degree enrollment has dropped 2.1% in the

spring of 2021 compared to a 0.6% decline in spring of 2020. Associate degree enrollment also declined by 10.5% in the spring of 2021, compared to 2.9% decline in the spring of 2020 (National Student Clearinghouse Research Center, 2021). This trend is concerning as sources project an increased demand for health professions, like nursing and RT, over the next 10 years (Bureau of Labor Statistics, 2019; Zhang, et al., 2018). Fitzgerald (2018) acknowledges that in the nursing profession, educational programs are expanding and growing, however not at a fast enough rate to compensate for the projected need. There are gaps in the literature in regard to RT education, however CoARC has reported a 42% decline in applications from 2011 to 2016 (CoARC, 2018). This decline in applications coupled with the increased future need in the RT workforce and the current COVID 19 pandemic, leave RT educators with cause for concern.

Recruitment Costs and Resources

Various researchers clearly recognized the costs associated with recruitment and indicated that not all institutions have access to the same funds or resources (Frandsen, 2016; Grabara et al., 2016; Hsueh, 2018; James-MacEachern, 2018; Lindner, 2015). Lindner (2015) indicated a recent strategy, from a business perspective, is to shift resources within the institution, allowing for increased resources to be dedicated to recruitment, with intentions of minimizing future spending. Linder (2015) used the example of Google, a company that is focused on the recruitment quality employees to avoid future remediation and replacement of underachieving employees. While not the same environment, if individual RT programs, shift resources and dedicate larger sums of money to develop solid recruitment plans, employ recruitment officers or teams, and advertise the profession and academic program, the end result could be higher quality recruits, full cohorts and an eventual increase in professional recognition.

Dennis (2020) introduced the idea of developing and using cohort marketing teams to recruit students. These teams would be responsible for targeting students, reviewing current articulation agreements, and continually researching for new cohort markets. No matter what strategies an organization decides to implement, ensuring proper planning and preparation of the recruitment process can influence the efficiency of the process (Grabara et al. 2016). Organizations alike need to identify and affectively measure competencies using ready-made tools on the market to ensure that an organization reduces the overall cost of recruitment. Grabara et al. (2016) noted that errors can occur from both the recruiter perspective and the perspective of the individual being recruited. For example, recruits can make errors in providing documents, during an interview or during practical activities and recruiters can fail to identify critical competencies and measure recruits' knowledge base. While there is no literature specific to RT education, from an RT education perspective, the literature supports the need for financial resources that can be dedicated to student recruitment and provides suggestions to minimize the cost of recruitment through the use of ready-made tools and social media.

Increasing Health Care Needs

According to the Bureau of Labor Statistics (2019) there is expected to be a 23% increase in respiratory therapy jobs over the next decade. This increase is a direct result of the projected increase in health care needs as the population continues to age strain the system and as current employees being to retire. This aging population will be comprised of approximately 75 million Baby Boomers, those born between 1946 and 1964. (Hussain, et al., 2012). Buchan, et al. (2015) noted that the majority of current world nursing shortages are related to changing demographics causing changes in health care needs, and this trend is likely to continue in the future. They noted that, other than the United States, many high-income countries' shortages will increase

significantly in the next 10 years unless the problem is addressed. In the United States, there will likely not be a future nursing shortage, however, for other smaller health professions that do not possess the means to implement a robust recruitment strategy, such as RT, the future is unknown.

Aging Population & Increased Health Care Cost

The aging population benefits society by allowing access to individuals capable of sharing life experiences while mentoring the younger generations; however, this same population is susceptible to chronic diseases and mobility issues and will continue to increase the strain on the health care system (Anderson, 2012). Anderson et al. (2012) cautioned that by 2030 approximately 20% of Americans will be over the age of 65 and that there is a chance the public health system will not be ready to care for everyone. The projected need for more RT coupled with the impact of the Baby Boomer's healthcare consumerism challenges the ability of the current workforce to provide quality care (Hussain et al., 2012).

Gusmano & Allin (2014) evaluated the issue of health care cost and its relationship to the aging populations of Canada, the United Kingdom, and the United States. They found that the most common cause of increased health care costs, in all three countries, was the aging population. As the Baby Boomer generation reaches retirement age, they are requiring more health care and, as a result, the cost of health care is projected to increase. From 1996 to 2013 health care spending related to aging increased by 11.6 percent or $135.7 billion, a trend that is expected to continue (Conway, 2017). Aging is not the only cause of increased health care cost, it is simply the most commonly discussed. Specific to the field of RT, Wroe et al. (2012) predicted a 96% increase in pneumonia related hospitalizations between 2004 and 2040. Adults over the age of 65 are at an increased risk developing pneumonia and account for about 60% of pneumonia related hospitalizations. This projected increase in hospitalizations could occur at a

significant cost, with Wroe et al. (2012) noting that in 2004 the 401,000 pneumonia related

hospitalizations cost $2.5 billion, a figure that is expected to increase with time and

hospitalizations. Dall et al. (2013) added that as the population ages, the complex medical issues

elderly patients often experience is exposing an increased need for specialists most necessary by

2025. While Dall et al. (2013) did not specifically assess an increased need for respiratory

therapists, their study did project an increased need for both pulmonologists and cardiologists:

the two overarching specialties of the RT profession.

RTs have the potential to impact the future of health care, especially as the population

ages and their care becomes more costly. RTs specialize treating the heart and lungs, both

common locations for chronic and acute issues among patients over the age of 65. RTs not only

work in the acute hospital settings but also have a crucial role in the long-term care and

rehabilitation settings of health care. The specialized care provided in cardiac and pulmonary

rehabilitation programs has been found to reduce hospital readmissions and therefore lower

health care costs (Altice & Gerow, 2020; Moore et. al., 2016). Pulmonary and cardiac

rehabilitation programs include patient assessment, education, and exercise regimes that help the

patient learn how to better manage the chronic issues they suffer (Altice & Gerow, 2020; Moore

et al., 2016). Altice & Gerow (2020) found that 6-week readmission rates for heart failure

patients who attended cardiac rehabilitation (CR) vs. patients who did not attend CR were 1.0%

and 3.5% (p<0.01) respectively. The hospital readmissions reduction program (HRRP) penalizes

hospitals that exceed the expected 30-day readmission rates for pneumonia, acute myocardial

infarction and heart failure (McIlvennan et al. 2015). According to McIlvennan et al. (2015) the

HRRP levied $280 million the first year and $227 million the second year on hospitals with

unacceptable readmission rates. Successful recruitment of the future RT workforce allows RTs to

continue to make a difference in the acute and rehabilitation settings of health care, and help reduce costs, that in the future, could potentially overwhelm the system.

Future RT Workforce

As the future of health evolves, so will the RT profession. Smith, et al. (2017) described the future role of the RT. By virtue of surveys sent to managers and staff RTs, results indicated that the workforce would continue to require highly prepared RTs, and will need to expand into all settings of health care to remain competitive. One of the major hindrances to the RT profession was the negative attitude toward the profession, even from the RT professionals themselves. Many RTs have considered leaving the profession or know someone who has left the profession because of their limited scope of practice and lack of confidence in the future. It is increasingly important to graduate strong, well-prepared RTs to maintain the workforce as health care needs continue to expand. If trends continue as in recent years, the significant decline in applications (42% between 2011 and 2016) will directly affect the future existence of a RT workforce (CoARC, 2018). The profession of RT is currently expanding and evolving every day, with degree advancement programs encouraging practicing RTs to obtain a baccalaureate degree and the development of an advanced practice RT, a role that is similar to a physician's assistant. As the field of RT evolves it is in dire need of recruitment and retention strategies that can help alleviate the pressures of health care needs.

Due to the current COVID-19 global pandemic, the future of RT has become even more critical to preserve. In an effort to assist the field of RT and ease the burden of staffing shortages, other health care professionals can be helpful when trained as RT extenders (Hester et al., 2020). The current state of the world is unique and requires rapid thought and action to preserve as many lives as possible; however, this is not a practice that will be able to perpetually continue.

According to Hester et al. (2020), RT extenders are non-RT health care professionals and medical students that have received training on novel RT therapies and can potentially double the maximum workload of a RT when under the RT's direct supervision. Currently, RTs "under standard, non-disaster conditions, an RT can safely manage up to 10 stable patients or 4 ventilated patients independently" (Hester et al., 2020, p149). Hester et al. (2020) emphasized the limitations of their study due to the global pandemic and recognized that the rapid training of RT extenders is only appropriate during dire situations. Additionally, RT extenders are not able to perform the high level and more critical aspects of the RT which only further highlights the need to produce well-trained RT specialists that are effective and surpass the expectations of the 2015 and Beyond RT (Barnes et al., 2010). These guidelines stress the importance of critical thinking, troubleshooting, and patient prioritization for RT graduates. The future of the RT workforce needs to be strong and able to think critically as the profession becomes increasingly crucial to the health care team. While RT extenders have helped improve the emergency situation that was brought on by COVID-19, they have not increased the number of qualified practicing RTs in the workforce. In order to meet the growing demands of health care, the field of RT education needs to continue to expand the number of graduates who eventually become fully licensed and credentialed health care professionals, meeting the qualifications and expectations of a current RT graduate.

Recruitment Strategies

The literature provides information on various recruitment strategies specific to health science education and higher education in general. The strategies described provide educational programs with perspectives on how to approach recruitment and then how to retain students until program completion. It is important to note that cost affects an institution's ability to use various

strategies for recruitment and retention. Every academic program and institution have different resources and budgets available to dedicate to student recruitment and retention, however with the use of technology and other creative outlets, recruitment and retention of RT students can potentially be improved at any institution.

Higher Education

Literature provides information about recruitment strategies that have are useful when recruiting to an institution of higher education. Tinto (1975) found that institutional quality, size, and type all have an effect on persistence. The effects of university selection on the likelihood of a student reaching graduation are great. Kalimullin and Dobrotvorskaya (2016) studied the factors that influence high school students when selecting a university. Of the 17 institutes within the Kazan Federal University (KFU), 1515 applicants were involved in questioning. Applicants stated their motives for applying to KFU, providing 29,715 responses that were grouped into the following categories:

- Getting a good education (20.1%)

- Highly qualified faculty (8.6%)

- University Prestige (13.6%)

- Availability of certain academic program (specialty) (14.6%)

- Advice of friends or relatives (3.7%)

- Advice of parents (2.8%)

- Coverage in the media (1.6%)

- Good material use and training facilities (10.1%)

- Admission to budget places (17.9%)

- Low tuition fee (1.5%)

- Prestige of the university independent of the tuition fee (5.5%)

Despite student feelings on the value of media advertisement, the authors reported a strong correlation between media advertisement and the resulting number of university applications, however the specific data was not provided to support this correlation. The authors recommended that universities continue to increase the value they place on media advertisement (Kalimullin & Dobrotvorskaya, 2016).

Similarly, Szekeres (2010) reviewed over 30 studies related to the reasons students make the higher education choices that they do. The author underscored the significance of a direct contact with a university, guidance counselors, and the opinions of significant others when deciding on a university. Social impact theory predicts these influences, referred to as proximity, and prestige as two of the main factors affecting the degree of influence a force exerts on a target (Latané, 1981). Additionally, Szekeres (2010) reported that many students, making a university selection decision, do not make rational decisions. Instead, they base most of their decisions on the information available to them at the time of application, and the more information about a university available, especially one without a significant reputation, the more likely a student will select said university (Szekeres, 2010). Marketing should reflect these decision-making practices and strategies are necessary to help inform the students and encourage their enrollment at a particular institution. While there is no related literature specific to RT education, educators should seek recruitment strategies that allow them to have direct contact with potential recruits and communicate frequently to ensure RT program information is readily available during the application period.

International Students. RT is a growing profession that has reached countries such as Singapore, United Arab Emirates, Canada, France, Germany etc...(ICRC, 2020). As the field of

RT continues to grow and expand into international arenas, the need for recruitment strategies specifically geared towards attracting international students increases. Recruitment of international students can be difficult at times, simply because of the physical distance and expense involved. As technology continues to provide opportunities for globalization, recruitment of international students has become increasingly popular. Technology allows institutions and academic programs to reach students in all parts of the world and disseminate information to those students that would previously been difficult or impossible to recruit. Sa & Sabzalieva (2018) discussed this trend, recognizing the increase in international students world-wide and the importance of developing public policies that support this cohort of students. In the United States international student numbers have grown from around 500,000 to almost 900,000 from 2000 to 2014, with the most substantial increase, almost 300,000 students, taking place from 2008 to 2014. Canada, England and Australia also reported to have increases in international students from 2000 to 2014, however the increases totaled approximately 400,000 across all three countries (Sa & Sabzalieva, 2018). While international competition impacts student recruitment, policy change and student support create a more welcoming environment and encourages enrollment. James-MacEachern (2018) suggested that while rankings do have an impact on most student recruitment, it is not always a potential student's determining factor. The author noted that international students often experience difficulty distinguishing institutions when many of them use similar pitches, endeavoring to promote the uniqueness of the individual program or institution. Identifying strategies to recruit into the field of RT on an international level, encourages the growth of the field and potential future expansion into new parts of the world. Ensuring these strategies are unique to the field or RT and the institution can promote

international student recruitment to a particular university and a particular area of study, such as RT.

Technology. Many students are familiar with technology; technology is an easy way to get the student engaged in their learning and assist with their success (Leitbag, 2017). Recently global advancements have taken place due to technology development and usage (Smith, 2012). Technology has become an intricate part of modern societies' everyday lifestyle and has even catalyzed education via online learning. Hsueh (2018), reported that in 2015 there were approximately 13 million online cross-border students world-wide, a number that does not include online domestic students. While traditional associate and baccalaureate RT programs require in-person and clinical education, multiple RT degree advancement programs, such as University of Cincinnati, Boise State University and Youngstown State University, rely on a distance platform and a 100% online platform.

The Internet and subsequent applications that utilize the Internet to function have been proposed as potential recruitment techniques. Supporting literature demonstrated that "Integrating technology into recruiting processes is not a goal in itself, but a means towards increased internationalization, and diverse and authentic means of interaction with potential students" (Hsueh, 2018, p 41). Many campuses provide virtual tours that can replace college visits, making university information more accessible to perspective students, including international students, or those who are not financially able to visit. Also, another important technology mentioned, social media, has had a great influence on college-aged students, and should be utilized as a recruitment tool, providing information to students from around the world (Hsueh, 2018). Individual programs interesting in attracting international students should develop and manage a variety of social media platforms, such as Facebook, Twitter, Instagram

etc.…, and use these platforms to connect with potential applicants, reaching them in a familiar and easily accessible format. Authors noted that in "a recent survey of undergraduate international students, 58 percent said they had no plans to visit a campus before applying and 28 percent said they wouldn't visit even after being accepted" (Hsueh, 2018 p 40). This trend enhances the importance of utilizing technology, especially when recruiting international students, who gather the majority of their institutional information from technology, like social media (Hsueh, 2018).

Additionally, a pilot study on retention and attrition in undergraduate online programs reported an adequate response rate of 18 percent in regard to feasibility and encouraged additional research in this field (Fraser, et al., 2018). As online educational opportunities continue to expand into all aspects of higher education, including the health professional and RT educational fields, research will be necessary to identify influences that directly affect this specific student population. However, it is necessary for research to address retention and strategies that not only influence online students but traditional, on-campus students as well. Factors that influence a student to leave a program or university, if addressed appropriately, may, in turn, influence another student to remain. Additionally, there is the potential that factors that influence a student's decision to leave will overlap into both the on-campus and online educational environment.

Frandsen et al. (2016) addressed the cost implications of recruiting through technology, and recognized specifically, the cost effectiveness of social media. While this article was specific to recruitment for health research studies, the conclusions can be applied to student recruitment as well. Frandsen et al. (2016) found that social media was an overall effective method for recruiting potential students. Social media platforms are typically user-friendly and easy to

navigate. Additionally, social media platforms do not require significant budgets and is accessible on a global scale. The authors noted the limitations of social media, likely attracting younger individuals, and those who are potentially less qualified. While young age is not a deterrent to student recruitment, the accessibility of program information to any and all individuals does pose the potential for an abundance of lesser qualified applicants. The authors recommended implementing a variety of technology-based recruitment strategies and including pre-screening questions in some digital formats to ensure the most qualified and appropriate applicant pool.

Health Sciences

Specific to the health sciences, literature discusses techniques to improve recruitment and retention, primarily in nursing education. Many of the health sciences are structured in a similar fashion and with adaptations, the techniques, could also apply to other health professional fields of study. Similar to higher education, a major factor in recruiting students to the field of nursing is interaction with nursing ambassadors (Tawash & Cowman, 2018). When attempting to influence a student's career choice, meaningful exposure to the career is paramount. Promotional videos and brochures, while still commonly used, do not influence students as significantly as an ambassador. Overall, Tawash and Cowman (2018) perceived that encouraging potential students participate in an intervention that improves their nursing knowledge, increased interest and allowing students to gain a better understanding of the field of nursing. The nursing recruitment intervention involved:

- a Nursing Career in Bahrain promotion video,

- a Nursing Ambassadors interactive seminar,

- hands-on nursing skills,

- information booklet (Tawash & Cowman, 2018).

Of the students involved in the intervention, 31.9 percent found the interaction with the nursing ambassadors to be the most effective at increasing their knowledge and interest (p<0.001) in the field of nursing (Tawash & Cowman, 2018). In contrast, the least effective strategies were the informational booklet and the promotional video. Students preferred, took more interest in, and retained more knowledge about nursing when the information came from an individual rather than a mass-produced booklet or video that was not as relatable or interactive.

In a similar fashion, Lubbe, et al. (2014) sought to develop a recruitment framework that could be utilized to encourage quality students to apply to the field of nursing. Through the development of this framework, which can be altered and applied to any profession, recruitment challenges and concerns were highlighted and addressed. Authors identified themes from previous phases of data collection and incorporated development of an approved recruitment plan, having a specified recruitment budget, employing a dedicated recruitment officer, involving stakeholders and ensuring quality assurance into the recruitment framework. Additionally, themes related to specific activities, such as technology use, recruitment activities sponsored by industry and targeting external applicants, were identified and incorporated into the development of their recruitment framework. Supported by social impact theory, funds knowledge theory and Tinto's dropout theory, Lubbe, et al. (2014) urged, "The importance of parents, significant others, elders in the community, faith-based leaders and charity organizations in the career-planning of young adults cannot be underestimated." (p. 6402).

Intrinsic factors, including various personality traits, impact career choice (Antony, 1998; Wu, et al., 2015). Prospective students who display an inherent desire to help others are likely to pursue a career in health care. Additionally, Wu et al. (2015) determined that extrinsic factors,

such as job security, finances, and prestige all potentially influence career choice, either

positively or negatively. Lack of job security or prestige could deter future health care

professionals, whereas high levels of job security, financial stability and job prestige may

encourage prospective students to apply to a specific health care professional program, like RT.

Supported by the funds knowledge theory (Moll et al., 1992), school is not the only source for

obtaining information and when family and cultural career perceptions are negative or non-

existent, recruitment can be severely hindered (Wu et al., 2015). Wu et al. (2015) performed a

review of 29 articles and recognized various themes that emerged in the literature specific to

interpersonal influences on career perceptions. The influence of family was found to be

inconclusive and dependent on the health care profession. However, when cultural influences

place high levels of importance on family, the impact of family on career choice was noted to be

greater (Wu et al., 2015). It is crucial to not only inform prospective students of the profession

but also to inform the students' cultural and familial communities of current information so that

their personal influences or forces do not negatively impact the recruitment process.

Recruitment Budgets and Recruitment Officers

Every educational program, including RT programs, have access to differing amounts of

resources to put toward recruitment. Some of these resources include a recruitment budget and

the employment of a dedicated recruitment officer. Lubbe et al. (2014) reported that all members

of a recruitment framework validation group recognized the need for a specific recruitment

budget, which is to be used for individual programs and separate from university recruitment

budgets. However, some members express concern over who would approve such a budget.

Additionally, all members of the validation group agreed that a dedicated recruitment officer

would be crucial for recruitment success (Lubbe et al., 2014). Mathis (2010) describes the role of

an admissions ambassador, or recruitment officer, as one who communicates with faculty and student alike, sharing information, identifying desirable attributes of an institution or academic program. Additionally, Gyure & Arnold (2001) described admission recruiters as front-line employees, which represent the institution and/or individual programs in some of the first contact with prospective students and their families. The authors also reported admission recruiters must have working knowledge of enrollment management and integrate that knowledge into their recruitment activities (Gyure & Arnold, 2001).

Contrary to the Lubbe et al. (2014) findings regarding the necessity recruitment budgets, Schultz & Zimmerman (2020) discussed North Carolina State University's low-cost program level marketing system that has been deployed for the past two years. Since the deployment of this program, 18 online programs have achieved 95-125% enrollment by the end of the second year (Schultz & Zimmerman, 2020). The authors suggest focusing on specific program marketing via online platforms and a well-developed website, establishing strong relationships with prospective students and conducting performance reporting to track website traffic (Schultz & Zimmerman, 2020). There is no literature specific to budgeting and employment of recruitment officers in RT education. However, the literature supports the establishment of recruitment budgets in order to improve the successfulness of student recruitment. There are however varying opinions as to the amount of budget necessary to result in successful student recruitment, especially as technology resources continue to advance and vary in cost and accessibility. Literature also supports the employment of recruitment officers, as an integral part of the process, forming relationships with prospective students and providing them with crucial programmatic information to make informed decisions.

Concerns or Issues During Recruitment

Recruitment in health science education is a complex and multi-faceted process. Diversity, student retention, the current state of health care and cost/resource allocation are all aspects that must be taken into consideration. As in any academic setting, socio-economic, racial, and cultural diversity, are important considerations when recruiting to RT educational programs. Diversity within an academic program has the ability to highlight issues that might otherwise be neglected and provides the opportunity for student growth as he or she is introduced to and considers issues never personally experienced. Additionally, retention of recruited students can become a major concern, especially when competing with better known health professions such as nursing and medicine. The current state of health care and the global pandemic created a unique additional issue of how to continue to recruit quality students safely, despite a rapidly spreading virus. Ultimately, a major factor that affects the ability for institutions and academic programs to recruit is cost and access to resources.

Ensuring Ethnic Diversity

Cultural and ethnic diversity allows students to experience others from different backgrounds and learn about their differences. Cultural influence contributes to student career choice, especially in fields such as nursing and RT. This is especially true in cultures where it is against normal practice for women to care for men (Tawash & Cowman, 2018). Understanding a variety of cultural practices can assist RT programs in successfully recruiting students from all ethnic backgrounds. Additionally, when programs make an effort to be culturally or ethnically supportive, graduates are likely to share positive feedback within their ethnic communities, ensuring diversity amongst future prospective students.

Milne et al. (2015) reported that only 1.2 percent of Australian students enrolled in higher education are indigenous people and discussed the influence culture can have on student success.

Partnerships with cultural communities and schools allow prospective students to experience a positive exposure to a particular academic program. Cultural respect, as well as family, community and peer support encourage indigenous student success (Milne et al., 2015). Additionally, Mosholder et al. (2016) discussed how influential culture can be to a student's decision-making process. Mosholder et al. (2013) identified themes from surveying Native American students enrolled in higher education and noted themes, such as the importance of community and student mentoring in the Native American culture. When attempting to recruit students of various cultures, it is important to understand that, in other cultures, verbal communication is the most successful method. Mosholder et al. (2016) reported that communication via the "grape-vine" (p 32) was significantly associated to mentoring and advising (B=.281, p<0.05). Student comments supported this finding, reporting that word of mouth is common in Native culture and that the institutions multicultural center is where news often spreads initially. By respecting a student's culture and encouraging mentoring relationships between past and future students, prospective students are encouraged to enroll in higher education, and subsequently the academic program with which they are familiar (Mosholder, et al., 2016). If RT programs find a way to create an inclusive environment for students from other cultures, this effort will become common knowledge, spreading throughout the classroom and their community, and potentially to improving recruitment for years to come.

Ensuring Environmental or Socioeconomic Diversity

Equally important to cultural and ethnic diversity is environmental and socioeconomic diversity. Enrolling students that represent all socioeconomic classes and environment backgrounds has a similar effect as ensuring the cultural diversity of an academic program. Rural students and students from lower economic areas have a tendency to remain within their comfort

zone, much like their cultural counterparts. Stone (2018) discussed the importance of recruiting students from rural areas but noted that, in order to successfully recruit these students, the program must have a good understanding of their values, often times revolving around their family and faith. Institutions are encouraged to emphasize the importance small town values, family, faith, and career that provides them hope for financial security in the future, when recruiting prospective students (Stone, 2018).

Underprivileged students, typically from urban areas, are also influenced by their values but are more likely to be influenced by future financial prospects and the information provided to them about career choices. The Health Affairs Pipeline Initiative (HAPI) and The Careers in Health and Medical Professions Program (CHAMPS) were developed to help expose low-income students to the health professions with the interest of increasing enrollment in the health sciences upon entering college (Mitchell, 2014; Wallace, et al., 2015). HAPI requires students who enroll in the program to attend multiple events aimed at increasing their knowledge of the health sciences. The initiative has been regarded as successful in increasing underprivileged student enrollment in the health sciences with hopes of continued growth in the future (Mitchell, 2014). From the initiation of the HAPI program in 2011 to the time of the publication, HAPI had engaged over 300 underprivileged students to at least four health sciences activities. The University of North Carolina at Chapel Hill that each health professional school now has at least 20% underserved minority students enrolled, however they planned to continue working towards matching university percentages. CHAMPS also was regarded as a successful program, introducing the health science professions to students and encouraging their academic success in math and science (Wallace, et al., 2015). Wallace et al. (2015) found that in 2012 the juniors (n=26) academic STEM H +knowledge (p=.00), and the seniors (n=22) academic STEM H+

knowledge (p=.00) significantly increased following CHAMPS sessions. In 2013 the sophomores (*n*=13) academic STEM H+ knowledge (p=.01) and career knowledge (p=.01), the juniors (*n*=20) academic STEM H+ knowledge (p=.00) and the seniors (*n*=19) academic STEM H+ knowledge (p=.00) significantly increased following CHAMPS sessions. Student surveys found that for the 25 rated sessions in 2012 (*n*=828) and 31 rated sessions in 2013 (*n*=577), youth rated the sessions as favorable or highly favorable. Both programs show promise for recruitment through exposure to the health sciences, much like the intervention of nursing ambassadors increased interest in nursing (Tawash & Cowman, 2018). Essentially, the more knowledge a professional program can provide to a potential student, the more likely he or she is to consider that program for his or her academic career. The literature supports the field of RT education establishing specialized programing or adding to previously established recruiting events with other health professions, targeting underprivileged students. Creating unique opportunities for underprivileged students to become exposed to and become involved in unfamiliar or previously inaccessible career pathways, such as RT or nursing, has the potential to recruit students from a variety of socioeconomic backgrounds, bringing a variety of perspectives to the classroom.

Recruitment During COVID-19

Hisel & Pinon (2020) discussed strategies specific to continuing student recruitment despite the current global COVID-19 pandemic. With limited travel abilities and social distancing, many recruitment events cannot occur as in past years. However, with the global pandemic, comes an increased demand for health care professionals, making recruitment more important for health professional educational programs. The authors suggested the use of social media and digital platforms to continue to reach prospective students domestically and

internationally. Social media and other digital platforms allow academic programs to provide prospective students with information that would typically be provided during in-person recruitment events, just in a safe and more globally accessible way. Academic programs must create platforms that are interactive and relatable for the students they intend to recruit. Hisel & Pinon (2020) also suggested utilizing current students and student assistants to assist with developing and maintaining the social media platform. These individuals will help ensure the content of posts will relate to and attract prospective students. Due to their proximity in age and educational status to prospective students, current students will better relate to the interests of potential applicants and understand what content will be eye catching more so than a faculty member. They also are likely more fluent in social media platforms, potentially allowing for more creative and interactive posts.

Retention Issues in Higher Education

The issue of retention cannot be neglected when considering recruitment. Recruitment should not be considered complete if large application pools result in small numbers of enrollment or students who switch majors before they even start. Heyman (2010) specifically examined retention in online programs, noting that connection with institution, faculty-student relationships, and student discipline are the major themes regarding retention. While most health science programs are in-person, there is an emerging trend for online degree advancement programs or mixed health science programs that have online and in-person components. As higher education evolves, it is crucial to consider the themes described by Heyman (2010) as possible barriers to retention. When RT students are initially accepted into a program, it will be critical to ensure involvement and personalization of their experience. Impersonal activities and experiences will leave students feeling isolated and could result in academic withdraw.

Personalizing recruitment and retention strategies for future students shows them they are a valued member of the program, which according to Tinto (1975) and Astin (1999) increases the likelihood that they persist.

Additionally, Mooring (2016) reviewed nursing literature and found that student retention is a complicated issue that requires a multi-modal approach. Changes in recruitment strategies, an aggressive approach to academic advising and having retention programs integrated into the curriculum have been shown to have potential in correcting the retention issues plaguing the field of nursing, and other health professional programs (Mooring, 2016). Retention programs, when embraced by both faculty and students, can help to identify at-risk students earlier and help find appropriate resources to assist the student in their ability to persist. Retention programs are often developed based on the specific needs of the student body, with focus on individualized academic planning, comprehensive orientation programs and learning communities (Mooring, 2016). While not specific to RT education, retention programs provide RT faculty and students the opportunity to ensure the educational experience is positive while also ensuring the quality of the graduate and future health care professional.

Morina and Orozco (2020) specifically discussed the issue of students with disabilities having lower retention rates than other nursing students. One of the problems highlighted in this study is that students often times do not disclose their disabilities to their academic program. They fear judgement by peers and faculty, and these individuals who do not receive the appropriate amount of support, are often high risk to drop out. While this fear of judgement and lack of disability disclosure affects all aspects of higher education, nursing and likely other health professional programs have noticed the trend and the impact it has on overall student retention. Overall, the study brought to light that students with disabilities may have access to

resources but that does not mean they have the appropriate support. In order for a student to be successful, they must be supported to use the available resources and encouraged to be open an honest about their needs in the classroom. Faculty should naturally develop an inclusive environment and utilize the unique challenges and perspectives students with disabilities can bring to the classroom as an opportunity to help everyone, including the faculty grow (Morina & Orozco, 2020). While there is no literature specific to students with disabilities decreasing student retention rates in RT education, the trend seen in nursing education can likely be applied to RT education due to the similar format of the academic programs. While nursing programs are often able to accommodate a large volume of students, RT education programs are typically smaller in size. This smaller cohort size, while positive in many ways, means that when a student is not successful, retention rates are affected to a greater extent. However, the smaller cohort size potentially provides RT faculty the opportunity to have a greater influence on students with special needs, provide a greater level of support and potentially prevent student drop-out.

Student Persistence and Motivation

Student motivation and self-belief or self-efficacy has been shown to be related to a student's persistence in higher education (Edgar et al., 2019). Edgar et al. (2019) performed a correlational study comparing student's scores on the Motivation and Engagement Scale-University/College (MES-UC) and admission variables, as well as comparing scores on the MES-UC and academic performance across the first year of study. In three of the four first semester courses, Foundations of Physiotherapy Practice (p=0.003), Anatomy A (p=0.024) and Behavioral Science (p=0.026) there was a significant relationship between student performance and their self-belief. Similarly, during the second semester, three of the five courses showed a significant relationship between performance and self-belief: Anatomy B (p=0.019, Anatomy

and Physiology of Body Systems (p=0.036) and Movement Sciences for Physiotherapy

(p=0.040) (Edgar et al., 2019). The authors concluded that there is a link between student

motivation and increased levels of self-belief and improved student success, well-being and

retention. Additionally, Edgar et al. (2019) discussed the importance of identifying students with

low self-belief early on and adjusting curriculum to accommodate and improve their motivation

and self-belief. Individualized targeting and follow-up with student with low self-belief allows

faculty to develop strategies and work with the student(s) to increase their engagement and foster

their self-efficacy levels.

There is no literature specific to self-belief and RT student retention rates. However, the

literature supports the notion that student motivation and increased levels of self-efficacy and

well-being result in higher levels of student retention (Edgar et al., 2019). Students that are

engaged in the curriculum and have a greater motivation to learn are more likely to succeed and

graduate as a qualified RT, ready to join the workforce. If RT faculty can target struggling

students, improve their motivation and increase their levels of self-efficacy or belief, they have

the potential to improve student retention and continue to support the needs of the health care

environment. Additionally, the literature supports the potential that if students who have high

levels of self-efficacy and well-being are targeted from a recruitment standpoint, there is an

increased likelihood that those students will persevere and successfully remain in the program

until graduation (Edgar et al., 2019)

Retention in Health Science Professional Education

Literature has shown multiple factors that influence retention rates in health science

professional programs, such as RT education and nursing. Many of the factors such as non-

indigenous status, matriculation scores, gender and finances, have a more dramatic effect on

student success during the first academic year (Mills et. al., 2009). Additionally, Mills et al.

(2009) found that second year student success was primarily affected by non-indigenous status,

first year marks and participation in mentor programs. According to Tinto (1975), academic

success has the largest influence on student retention, however little research has been done

discussing specific factors that affect professional program student retention. Research is needed

to determine if there are additional factors that influence student retention, specifically in RT

education, that emerge once a student is enrolled in their professional program of choice.

One factor that has been found to influence RT student retention is the availability of

resources: operating budget, personnel budget, number of faculty positions, number of staff-level

positions and the number of clinical sites (Ari, 2009). Ari (2009) found that the mean personnel

resources per student was significantly positively correlated with mean student retention rate (r

0.353, p=0.001). The study also found that mean financial resources per student was significantly

strongly positively correlated with the mean student retention rate (r 0.566, p= 0.001). However,

the study showed no significant correlation between mean clinical resources per student and

mean student retention rate. Ari (2009) continued analysis with a multiple regression and found

that between mean financial resources per student and mean personnel resources per student,

only the mean financial resources per student significantly predicted program performance on

student retention (p<.004). It was noted that for every $1,000 spent per student, the program

retention rate will increase by 1% (Ari, 2009). The conclusions based on these findings were that

financial and personnel resources are an integral part of RT student retention and should not be

limited. RT programs that dedicate more financial and personnel resources to their students will

have higher student satisfaction and retention rates.

Morina and Orozco (2020) emphasize another important factor in health science student retention, the inclusive classroom. The authors recommend finding unique ways to promote learning and persistence for students based on the individual needs of the student body, paying particular attention to the needs of students with disabilities. When students with disabilities are not supported nor provided the appropriate resources for success throughout the whole curriculum, the retention rates of health science professional programs are affected. Recent trends in nursing education show that students with disabilities have higher rates of drop-out. The authors note that students with disabilities should be closely monitored and also appreciated in the classroom as they allow for faculty to explore new learning styles and they allow students to become more sensitive to others. These students provide a unique perspective in the classroom and challenge their peers and faculty alike to find ways to interact productively. Additionally, the authors note that faculty should receive support from the university, obtaining training to encourage sensitivity, inclusive pedagogy and universal learning design for all students (Morina & Orozco, 2020). Faculty professional development could provide RT educators with the tools necessary to reach all of the RT students with the content and knowledge necessary to be a licensed and fully credentialed RT.

<div align="center">**Summary**</div>

Recent trends have shown a decline in health science applications, especially those in the field of respiratory therapy (CoARC, 2018), and an increased need for health care in the future. Recruitment and retention of students in the various health science fields has become an increasingly important issue. Utilization of social impact theory, along with other theories focused on the retention of students and career choice could help to reduce the decline in applications and boosting applications into the various health science fields. Strategies exist for

recruitment into the field of nursing, the largest of the health sciences, as well as higher education as a whole. However, little is known about how to specifically recruit into a specialty field within the health sciences, RT. A gap exists in the literature pertaining to recruitment and retention in RT education. While similar to the other health science professions in structure, RT is not as prevalent and recognizable as nursing and other health professions. This anonymity combined with recent trends causes concern nationwide, as the need for health care, including respiratory therapists, continues to increase.

Aside from strategies specific to the health sciences, literature supports recruitment of diverse, ethnically, environmentally and socio-economically, student populations and describes strategies to accomplish this goal (Milne et al. 2015; Mitchell, 2014; Mosholder et al., 2016; Stone, 2018; Tawash & Cowman, 2018; Wallace et al., 2015). Recruitment strategies, across all areas of higher education, should be considered as potential strategies to improve enrollment in RT education programs. As health care needs increase and the role of the RT evolves, it will become essential to maintain and expand the profession in order to help those with breathing issues for the future. When considering recruitment strategies, it is critical to also consider the financial burden associated with the various recruitment plans. The existence of a recruitment budget or dedicated recruitment officer could prove to be critical in the recruitment process, allowing the program to utilize a variety of resources and advertising strategies that the RT program otherwise might not have access too. Latané, (1981); Tinto, (1975); and Astin's (1999) respective theories all exemplify the importance of social forces and involvement in student persistence and decision-making. Through the use of technology, specifically social media, recruitment efforts have the potential to be more cost effective and reach students on a global scale.

Another important aspect of successful recruitment is the ability to retain students once admitted. Health science professional programs, such as nursing and RT, have shown issues with student retention and noted a link between student motivation, persistence and self-efficacy or belief and retention (Edgar et al., 2019; Mooring, 2016). Additionally, students with disabilities have been shown to have higher rates of drop out than other students, affecting the retention rates of a variety of educational programs (Morina & Orozco, 2020). Specific to RT education, there is a positive correlation between the amounts of financial and personnel resources dedicated to each student and a RT programs retention rates.

Recruitment into the field of RT and subsequently the retention of RT students is not well researched, however similar health professional programs, such as nursing, have shown the importance of identifying strategies that are specific to the academic program and the target students. Without proper recruitment, utilizing RT appropriate strategies, and the ability to retain students, the field of RT will not have the capacity to support the growing health care needs. A consequence of not supporting the growing needs of health care could be the field of RT being forced to share professional responsibility with other health science fields, such as nursing, rather than maintaining on its own and evolving based on the needs of the environment. Without appropriate faculty training, and professional as well as student support resources, retention rates of RT programs will potentially suffer, once again affecting the capacity of the field to support the growing health care needs.

CHAPTER THREE: METHODS

Overview

This chapter begins by providing a rationale for the chosen predictive correlation descriptive research design. The research questions and null hypothesis are presented followed by a description of the participants and setting. The instrument is introduced and explained. The chapter concludes with the procedures and data analysis sections.

Design

This study, on recruitment in respiratory therapy (RT) education, employed a non-experimental, one-shot case study correlational design and included a descriptive component to support findings. This is the appropriate design because it allowed the researcher to examine relationships without manipulating or controlling the variables and is a useful way to gather preliminary data. This study sought to evaluate relationships and determine if there is a predictive relationship between RT student first time TMC exam high cut and CSE success rates, resulting in the credential of RRT, and student self-efficacy and student persistence. This study is limited by convenience sampling, which could result in subject bias.

Variables

For this study the binary criterion variable were recent RT graduates first time TMC exam high cut and CSE pass rates. The combined TMC exam high cut and subsequent CSE score combine to earn the graduate the credential of RRT (NBRC, 2022). As previously noted, as of 2018, the state has changed its revised code to require the credential of RRT in order to obtain a license to practice respiratory care in the state of Ohio (State of Ohio, 2020). The predictor variables was the recent graduate's level of persistence and self-efficacy. Persistence, or remaining in an academic program and/or institution, is affected by many factors such as: family

income, academic degree level, student involvement, academic performance, race, social integration, employment, and marital/family status (Leppel, 2002). Persistence was measured using the College Persistence Questionnaire-Version 3 Short Form (Davidson et al., 2015). According to Dinther et al. (2011), self-efficacy is one's beliefs in their capabilities to attain their goals and is a significant variable in student learning as it affects motivation and learning. Self-efficacy was measured using the Career Decision Self-Efficacy Scale (Betz & Taylor, 2012). Recent RT graduates were asked to answer the above-mentioned surveys, reflecting back on their recent time as a RT student.

Descriptive Component

Recent graduates from 2016-2022 were asked to identify recruitment strategies utilized by the RT program prior to their acceptance to the program. This portion of the questionnaire was a select all that apply question with an open-ended option as well. This required participants to select recruitment strategies known to be utilized by the program, with space to generate their own list of additional recruitment strategies they may have experienced and expand upon their experiences if they so choose. Recruitment strategies were gathered, categorized into groups based on the literature and lumped in with other similar strategies and techniques.

Research Question

The research question the logistic regression answered is:

RQ1: How accurately can first time TMC exam high cut and CSE pass rates be predicted from a linear combination of Lifestyle Index factors for recent RT graduates in an Ohio University?

Hypothesis

The null hypothesis for this study is:

H₀1: There will be no significant predictive relationship between the criterion variable (first time TMC exam high cut and clinical simulation exam pass rates) and the linear combination of predictor variables well-being, and persistence for recent RT graduates of an Ohio University.

Participants and Setting

Population

The population for this study included recent graduates from an undergraduate RT program. Each recent graduate was enrolled in a CoARC accredited baccalaureate degree entry to practice RT program located in the Midwest. The baccalaureate degree entry to practice RT program followed the two plus two model of instruction. This model includes two years of prerequisite and general education courses, followed by two years of full-time RT core courses.

Participants

This was a sample of convenience and the participants sampled for the study were all 140 recent RT graduates of an Ohio university enrolled from 2014-2022. The participants were not randomly selected, as they chose to be involved in the study by responding to the survey. According to Warner (2013), the minimum sample size for a linear regression with two predictor variables is $N > 50 + 8(k)$ or $N > 66$. 140 students were sampled to maximize the potential to obtain responses from at least 66, if not more, participants. Additionally, Gall et al. (2007) stated 66 participants were necessary to be sampled to assume a medium effect size with a power of .7 at the .05 alpha level.

RT students are normally between the age of 18-21 upon application and admission to the RT program, having completed 1-3 years of course work prior to enrollment. Participants in this study are between the age of 20 and 59, with about 91% of the participants falling between the

age of 20 and 29. The sample consisted of 85% females and 15% males. Immediately following completion of the program, RT graduates are eligible to complete the TMC exam and subsequently the clinical simulation exam. Successful completion of these examinations allows the RT graduate to apply for a license and secure employment in the health care workforce.

Setting

The Ohio university is a public land grant university in Columbus, Ohio that offers undergraduate, graduate and post-graduate degrees. The undergraduate students at the university and RT program are considered traditional students, participating in on-campus learning. The RT program is a part of The School of Health and Rehabilitation Sciences and The College of Medicine. The RT program offers a four-year degree, in which the first two years are prerequisite courses and general education, and the final two years are dedicated to RT curriculum, with didactic lectures, laboratories and clinical rotations included. A database of graduates will be gathered from program records stored at an Ohio university. The researcher has access to these program records as a member of the program faculty at the university.

The research setting will be online using Qualtrics to collect demographics and survey responses from recent graduates of the RT program at an Ohio university from 2014-2022. The RT program provides graduates with an entry to practice baccalaureate degree. The research instrument will be discussed in the next section.

Instrumentation

For this study an online survey, was administered via Qualtrics. The purpose of this survey was to gather information specific to the persistence, and self-efficacy of recent RT graduates and the recruitment practices of an Ohio university RT program. The data collected included age, gender, and responses to the two identified short form instruments, the Career

Decision Self-Efficacy Scale Short Form and the College Persistence Questionnaire-Version 3

Short Form. Additional information in regard to recruitment strategies experienced by RT

graduates was also gathered with an open-ended question. The questionnaire (Appendix A)

consisted of 54 questions, including the demographics, with multiple choice answers and an

open-ended space for participants to provide a list of recruitment strategies. Multiple choice

questions contained Likert scales that have specific numerical values assigned to each response

option. The survey took about 30 minutes to complete.

The Career Decision Self-Efficacy Scale Short Form

The Career Decision Self-Efficacy Scale Short Form (CDSE-SF) is a 25-item survey that

has been adapted by Betz & Taylor (2012) from the original 50-item version. Originally adapted

in 1996, the short form has been updated as of 2012. The purpose of the instrument is to measure

an individual's degree of belief that he or she can successfully complete tasks necessary to

making career decisions (Betz et al., 2012). The CDSE-SF is widely used to assess context-

specific self-efficacy. Integrating theories stemming from clinical/social psychology and

counseling/vocational psychology, Betz and Taylor (2012) developed this form to assist with

research in the field of career decision making and to provide a practical tool to assist counselors

as they help individuals navigate career decisions. This instrument has been used in numerous

studies, in a variety of countries around the world (e.g. Gaudron, 2011; Kavas, 2014; Presti et al.,

2013).

Instrument reliability across different language versions and within different populations

has been shown (0.91) and there is also evidence for criterion-related validity (Makransky et al.,

2014). Content, substantive and structural validity, as well as generalizability were assessed by

Makransky et al. (2014). The CDSE-SF was found to be substantively valid, with the 5-point

Likert-type scale functioning appropriately. The CDSE-SF was found to separate well between high and low ends of the scale, however there is an issue with some multidimensionality noted in the short form. Researchers recommend that in order to ensure validity when using the short form, consideration for the subscales must be used. Structural validity was evidenced as four of the five subscales were unidimensional in the original and cross-validation analysis. The inconsistencies in the 5th subscale were attributed to statistical artifact, as they were not consistent across the original and cross-validation analysis. Additionally, the 5-point Likert-type response categories function as intended and showed substantive validity. While the instrument reliability was found to be 0.91, individual subscale reliability was found to range from 0.66 to 0.73 for Cronbach's α and 0.65 to 0.72 for person separation (Makransky et al., 2014). Cronbach's α will be reported once the data has been run.

The instrument's 25-items utilizes a 5-point Likert-type scale with scoring guidelines included upon purchase of the instrument, manual and licensing agreements. The Likert scale utilized on the CDSE-SF has responses that range from No Confidence at All to Complete Confidence. Responses are as follows: No Confidence at All = 00, Very Little Confidence= 00, Moderate Confidence = 00, Much Confidence= 00, Complete Confidence=00.

The College Persistence Questionnaire-Version 3 Short Form

The College Persistence Questionnaire-Version 3 (CPQ-V3) Short Form was adapted by Davidson et al. (2015) from the 2nd version of the same questionnaire. The purpose of this instrument is to predict retention among university and community college students. In order to adapt this instrument from the 2nd version to the 3rd version/short form Davidson et al. (2015) mapped the items against conceptual domains of interest and reviewed the questionnaire to ensure the questionnaire met their needs and was at the appropriate level for the students being

surveyed. Davidson et al. (2009) developed the original College Persistence Questionnaire, later modified into version 2 and the CPQ-V3, after recognizing common variables related to persistence and drop-out rates across many previous studies. The original and subsequent versions of the instrument have been utilized in multiple studies related to retention and attrition (e.g. Garcia-Ros et al., 2019; Pugh et al., 2018)

Content validity was assessed by 10 experts who reviewed the adapted 3rd version and ensured that each item truly reflected the conceptual domain of interest. Experts also made suggestions about rewording when necessary. The Content Validity Index (CVI) was utilized to validate the existing instrument (version 2) and the CPQ-V3. Experts rated each item's content relevance on a 4-point scale. Item-CVIs ≥ 0.78 were found to be acceptable and average scale level-CVI ≥ 0.90 were found to be acceptable. Experts endorsed the adaptation and found the CPQ-V3 to be valid at the item level of 0.90-1.00 and overall, on the average scale level of 0.98 (Pugh et al., 2018).

The CPQ-V3 consists of 32 questions that have been arranged into 10 subscales of satisfaction. These 10 subscales include: Scholastic Conscientiousness, Academic Integration, Social Integration, Institutional Commitment, Degree Commitment, Advising Effectiveness, Motivation to Learn, Academic Efficacy, Financial Strain and Collegiate stress. The Instrument utilizes a 5-point Likert scale ranging from Very Favorable (+2) to Very Unfavorable (-2), with a 6th option for Not Applicable. Scores from each question will be added together, ranging from -64 to 64. Each individual score will be added together and divided by the number of responses that do not include Not Applicable to obtain an average favorability. Higher scores reflect higher favorability with their college experience and predicting higher persistence rates. Lower scores

reflect low favorability with college experiences and predict higher risk of withdraw from the institution.

Procedures

In order to conduct this study, IRB approval from Liberty University was obtained (Appendix A). Additionally, the researcher received IRB approval from the midwestern university that the convenience sample will be drawn from (Appendix B). Next, a database of recent students of the RT program at an Ohio university was obtained from program files. Email addresses of graduates from the RT program from 2014 to 2022 were collected and used to contact participants. The survey instrument (Appendix A) was loaded into Qualtrics. Once loaded into Qualtrics, the survey was shared with 5 currently enrolled RT students to ensure clarity, understanding of directions and functionality of the online survey. Participants were contacted via an email with a recruitment letter (Appendix C) and a Qualtrics link to the survey (Appendix A). Due to the survey being anonymous, participants waived their consent (Appendix D) on the first page of the survey.

The survey contained 54 multiple choice questions with Likert scales providing ordinal answers and open-ended questions to address the descriptive component of the research. The first page of the survey included a consent statement instructing participants to exit the survey if they do not consent or continue if they do consent to participate (Appendix A). As long as the participant consented to participate, the following page included the instructions, providing guidance for the participant for completing the survey (Appendix A). After reading the instructions the beginning questions of the survey gathered demographic information about the participant. Demographics gathered included age, gender, and credentialing status, including details about the TMC exam and CSE first attempt success (Appendix A). Next, participants

answered the descriptive research-based questions, regarding recruitment strategies and their personal journey to RT education (Appendix A). Finally, participants answered the 32 question CPQ-V3 and 25 question CDSE-SF. The survey was expected to take approximately 30 minutes to complete.

Participants were allotted 3 weeks to complete the survey and a reminder email (Appendix E) was sent with 1.5 weeks remaining and then again 3 days before the survey was closed. Once the data collection period has ended, data was downloaded from Qualtrics by this researcher, de-identified and placed into a Microsoft Excel® database (Appendix G). The Excel® database was stored on the researcher's personal password protected Microsoft Surface Pro 4 laptop. A backup copy was stored on a dedicated USB thumb drive.

Responses to the survey were analyzed to determine if there is a relationship between recent RT graduates and their persistence and self-efficacy. Recruitment strategies experienced by the graduates were gathered in the survey and utilized to provide a better understanding of current practices and support the development of a RT specific recruitment framework. The data transcribed into Microsoft Excel® was imported into the Statistical Package for the Social Sciences (SPSS). When the data was discussed, all results had been previously de-identified. The statistical analysis will be discussed in the next section.

Data Analysis

Warner (2013) explains that logistic regression is a way to identify each variables unique contribution to the explained variance. This type of analysis allows for each individual predictor variable in this study to be analyzed, determining which variable, if any, to credit with predicting the variance. To examine the research question, a binary logistic regression was conducted to assess if first time TMC exam high cut and clinical simulation exam pass rates can be predicted

from a linear combination of Lifestyle Index factors for recent RT graduates of an Ohio university. The binary logistic regression is an appropriate statistical analysis when the purpose of research is to assess if a set of nominal, ordinal, or interval/ratio predictor variables predict a dichotomous dependent variable (Pituch & Stevens, 2015). This analysis allowed the researcher to determine the odds of a RT graduate passing the TMC exam with high cut and passing the CSE, obtaining the RRT credential, on the first attempt based on the combination of predictor variable values.

Pearson's correlation measures the relationship between continuous variables and determines the strength of that relationship. Pearson's *r* can have a value ranging from -1.0 to +1.0, with the sign of Pearson's *r* designating the direction of the relationship and the numerical value indicating the strength. The closer the value is to 1.0, either positive or negative, the stronger the linear relationship. A value of 0 would indication no linear relationship. When the value is a positive number, as one variable increases so will the other, when the value is a negative number, when one variable increases the other variable decreases. While correlation will identify the strength and existence of a relationship, it will not indicate causation (Warner, 2013). Once the existence of a relationship was determined, Logistic Regression was utilized to determine if the relationship is predictive and which of the predictor variables has the strongest ability to predict first time pass rates on the TMC exam and CSE.

Data screening began by visual inspection to ascertain missing data points and inaccurate entries. Warner (2013) emphasized the importance of assessing for outliers within variables. Screening for extreme outliers was conducted using box and whisker plots. It is not necessary to have predictor variables demonstrate a normal distribution, a linear relationship to the criterion variable, or an equal variance within groups (Tabachnick & Fidell, 2019).

Logistic regression assumes the absence of multicollinearity. Multicollinearity represents "the degree of intercorrelation among predictor variables" (Warner, 2013, p. 1100). In the presence of multicollinearity, it becomes more challenging to appreciate each predictor variable's unique contributions to the regression model (Gall et al., 2007; Warner, 2013). Variance inflation factors (VIF) were used. VIF greater than 10 suggests the presence of multicollinearity.

The overall model significance for the binary logistic regression was examined using the χ^2 omnibus test of model coefficients. This will satisfy the assumption of good fit. McFadden's, Cox and Snell's and Nagelkerk's R^2 were examined to estimate the percent of variance accounted for by the independent variables. The dependent variable needed to be binary and independent observations were made. Predicted probabilities of an event occurring were determined by Exp (B), also known as the odds ratio. The Wald statistic represents the chi-square values of the ratio of the coefficient and the standard error and was displayed as a SPSS® output. The Wald statistic was utilized to determine significance of the variables (Pampel, 2000). Classification accuracy was demonstrated by a classification table. Classification tables "show how well or poorly the predicted group memberships correspond to the actual group memberships" (Warner, 2013, p1076). Additionally, the maximum likelihood estimation was completed in order to determine which parameters are most likely to result in the desired effect. Alpha-priori will be set at p<0.05.

According to Warner (2013), the minimum sample size for a linear regression with two predictor variables is $N> 50+ 8(k)$ or $N>66$. 140 students were sampled to maximize the potential to obtain responses from at least 66, if not more, participants. Additionally, Gall et al. (2007)

states 66 participants will need to be sampled to assume a medium effect size with a power of .7 at the .05 alpha level.

The descriptive data collected in this research was used to help provide a basic understanding of current successful recruitment strategies utilized in RT education and allow for the development of a RT recruitment framework. The development of a RT specific student recruitment framework will also take into consideration the recruitment strategies identified in the literature specific to higher education and health sciences.

CHAPTER FOUR: FINDINGS

Overview

The purpose of this study is to discover if there is a relationship between first time Therapist Multiple Choice (TMC) exam high cut and clinical simulation exam (CSE) pass rates of recent RT graduates at an Ohio university and their persistence, providing a base for a recruitment framework in RT education. The predictor variable is persistence, and the criterion variable is the first time TMC and CSE pass rates. Persistence scores were converted to favorability scores and data was screened for univariate and multivariate outliers. A logistic regression was used to test the hypothesis. Recruitment strategies were reviewed and trends in well-being scores were noted. The Findings section includes the research question, null hypothesis, data screening, descriptive statistics, assumption testing and the results.

Research Question

RQ1: How accurately can first time TMC exam high cut and clinical simulation exam pass rates be predicted from a linear combination of Lifestyle Index factors for recent RT graduates in an Ohio University?

Null Hypothesis

H_01: There will be no significant predictive relationship between the criterion variable (first time TMC exam high cut and clinical simulation exam pass rates) and the linear combination of predictor variables well-being, and persistence for recent RT graduates of an Ohio University.

Descriptive Statistics

Participants ranged from 20-59 years of age, with ~15% of respondents being male and ~85% of respondents being female. Of the 140 graduates recruited to participate, 74 completed

the survey with 68 of those completing the survey in its entirety. Of the 68 complete surveys, 56 (82%) of the respondents passed both the TMC and CSE on the first try, 2 (3%) of the respondents have yet to pass the TMC and CSE, 6 (9%) additional respondents did not pass the TMC on the first try and 4 (6%) did not pass the CSE on the first try.

Recruitment Strategies

Participants noted a variety of recruitment strategies utilized when choosing their academic major. Common trends were having friends or family already in the field, freshman survey class, university sponsored recruitment events such as the involvement fair, and self-research. Many participants noted that they were not recruited to the program, rather advised by academic advisors based on their graduate school aspirations or that they happened upon the program when researching options and declaring a major.

Results

Data Screening

The researcher screened the data for inconsistencies and sorted the data by predictor variables (self-efficacy and persistence). When data screening the researcher found no outliers and that the CDSE-SF instrument was not uploaded into the Qualtrics survey in its entirety and therefore the data from these questions could not be included in the logistic regression. However, this data was still sorted and used to provide descriptive statistics and to discuss potential for future research.

Assumption Tests

The null hypothesis was tested using a binary logistic regression. A logistic regression required that the outcome variable was dichotomous; first time TMC exam and CSE pass or not first time TMC high cut exam CSE pass. Another assumption of logistic regression is the

absence of multicollinearity among predictor variables. For this logistic regression, due to the error in the survey, there was only one predictor variable. VIF was not calculated, and multicollinearity was not an issue due to the single predictor variable. Another assumption is that the sample size is large enough. For this logistic regression sample size was required to be greater than 66. This assumption was met with a sample size of n=68. The final assumption is that data contained no omitted or irrelevant variables and that the data was functional. All assumptions were met.

Hypothesis

The binary logistic regression analysis was conducted to determine if the persistence could predict first time TMC high cut exam and CSE pass rates at the 95% confidence level. The results of the logistic regression were statistically significant, χ^2= 6.549, p=.010; however, the model was weak according to the Nagelkerke R data (R^2 = .151) and the Cox and Snell R data (R^2 = .92). Additionally, the prediction was correct 85.3% of the time. The statistical significance of the model required rejection of the null hypothesis. Further review of the data is presented in Table 1 (Omnibus Test of Model Coefficients) and Table 2 (Model Summary).

Table 1

Omnibus Test of Model Coefficients

		Chi-Square	df	Sig.
Step 1	Step	6.549	1	.010
	Block	6.549	1	.010
	Model	6.549	1	.010

Table 2

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	56.827[a]	.092	.151

Note [a]. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

The Wald ratio for persistence was statistically significant, Wald=5.726, p=0.17. This result shows a significant difference in the odds of passing the TMC exam at the high cut score level and the CSE on the first attempt and obtaining the credential of RRT based on the student's level of persistence. See Table 3 (Variables in the Equation) for summary of results.

Table 3

Variables in the Equation

		B	*S.E.*	Wald	*df*	Sig.	Exp (B)	95% CI for EXP(B) Lower	Upper
Step 1[a]	Persistence	-3.389	1.416	5.726	1	.017	.034	.002	.542
	Constant	1.293	1.178	1.204	1	.273	3.644		

Note [a]. Variable(s) entered on step 1: persistence.

CHAPTER FIVE: CONCLUSIONS

Overview

Chapter Five contains the discussion of the dissertation. This discussion will begin by reviewing the study and its purpose, followed by conclusions. Implications of the research will be discussed, focusing on the significance of the study and the additions to the body of knowledge regarding this study. Finally, the limitations and recommendations for future research will be discussed, allowing the researcher to suggest next steps and future recommendations in regard to RT education.

Discussion

The purpose of this study was to discover if there is a relationship between first time Therapist Multiple Choice (TMC) exam high cut and clinical simulation exam (CSE) pass rates of recent RT graduates at an Ohio university and their well-being and persistence, providing a base for a recruitment framework in RT education. Recent graduates were surveyed about their levels of persistence and well-being during their time enrolled in the RT program, as well as on recruitment strategies they experienced when choosing their major.

The research question for this study was: How accurately can first time TMC exam high cut and clinical simulation exam pass rates be predicted from a linear combination of Lifestyle Index factors for recent RT graduates in an Ohio University? Answering this question required the use of logistic regression to test the null hypothesis that there is no significant predictive relationship between the criterion variable (first time TMC exam high cut and clinical simulation exam pass rates) and the linear combination of predictor variables well-being, and persistence for recent RT graduates of an Ohio University. The overall model had a p-value less than .05 at a 95% confidence interval, which resulted in this researcher rejecting the null hypothesis.

The research shows that students who exhibit characteristics associated with persistence in higher education are more likely to be successful on assessments of competency, such as credentialling exams, on their first attempt. Prior research supports this notion that student motivation and increased levels of self-efficacy result in higher levels of student success, well-being and retention (Edgar et al., 2019). The expectations of the 2015 and Beyond RT expect educational programs to produce well-trained RT specialists that comprehend the importance of critical thinking, troubleshooting, and patient prioritization for RT graduates (Barnes et al., 2010). Projected increased need for future health care workers due to retirement, age and cost have been exacerbated by the COVID-19 pandemic, making it critical to produce graduate RTs capable of completing the RT program and obtaining their RRT on the first attempt. Targeting potential students who are likely to be successful on the credentialing exams required to practice as an RT, has the potential to ensure academic retention in the program and that graduates join the workforce and help to ease the increased workload due to increased patient age, workforce retirement and increased costs of health care.

Due to an error in the survey building, an incomplete version of the CDSE-SF was administered and therefore logistic regression was not used to analyze the data from this specific survey. Although limited, the data that was collected appears to support the persistence results. Looking at cross-tabs of the incomplete survey showed trending that supports high self-efficacy having a positive relationship with persistence and graduate success on the TMC and CSE exams. Edgar et al. (2019), noted a similar relationship between persistence and self-efficacy, recognizing that these are closely linked in regard to student success and retention. All five subscale scores and the total score of the CDSE-SF showed that graduates who passed their TMC and CSE exams on the first attempt had self-efficacy levels trending toward neutral and

high.

The descriptive component of this research asked graduates to reflect on the recruitment process and share their experiences at an Ohio University. Overwhelmingly the comments stated that many students found the RT program on accident. Graduates often mentioned an interest in the medical field leading them to find the RT program on websites or reflect back on their personal health experiences and subsequently locating the RT program at their university. Another common graduate comment was that they heard about the RT program during an undergraduate survey or exploration course presentation or at a dedicated health science recruitment event such as the college open house/information session. Graduates referenced the faculty involvement during these courses or events and the reputation of the program as strong recruitment techniques that ultimately influenced their decision to apply and pursue RT as a career. The final common theme in the comments was a family or personal connection to someone in the field of RT. Whether this be family, friend or acquaintance, graduates mentioned that interacting with RTs inspired their decision to be an RT.

These comments support the literature in higher education and health science recruitment and retention. Tawash and Cowman (2018) note that in nursing, one of the strongest recruitment strategies is exposing potential students to nursing ambassadors. Graduates mention meeting RT faculty at events and during courses as a major influence on their decision to become an RT. Graduates also note the influence of alumni and a personal connection with an RT as a strong influence in their decision to choose RT as a career path. Having a strong RT community that supports the education program, internally and externally, and actively participates in recruitment should be considered an important piece of an RT recruitment framework.

Additionally, Kalimullin & Dobrotvorskaya (2016) stress the importance of the perceived

quality of the educational program when recruiting students. In support of this, James-MacEachren (2018) references the importance of standing out amongst the competition Graduates often referenced the reputation of the RT program at an Ohio University as an important reason for their continued exploration and eventual application to the RT program. Gradates note that the excellence of the faculty and the program both influenced their decision to apply and ultimately graduate from the RT program. Hseuh (2018) mentions online platforms and social media as strategies to reach the current generation of perspective students, both nationally and internationally. The ability to research the reputation and accomplishments of an RT program and have proof of excellence available to perspective students, especially in online forums, is an excellent strategy for recruitment.

Finally, both Astin's (1999) and Tinto's (1975) theories suggest that personalizing course activities and student involvement are strongly related to student retention. While part of the recruitment process, graduates noted the personalized nature of the presentations and the family atmosphere that was apparent during events with faculty and current students as major influences in their decision to choose RT and remain in the major until graduation. Potential students that are able to witness and experience a positive educational environment when choosing a major are likely to be influenced to apply and join the RT program. Culturing an environment of support and RT community involvement is another important part of a future RT recruitment framework.

Implications

Recruitment in RT education is a current problem faced nationwide. This research provides an additional tool to aid in the recruitment of students who will be most likely to pass the TMC exam with a high cut score and the CSE exam on the first try. Potential future students who have high levels of persistence will be significantly more likely to pass their TMC with a

high cut score and their CSE exam on the first try. The limited data set related to self-efficacy

seems to support the findings related to persistence and success on TMC and CSE exam. There is

the potential to use both persistence and self-efficacy assessments not only for targeting students

during recruitment, but also as a component of the admission process. Persistence and self-

efficacy assessments could be woven into both written and oral interviews to ascertain a cohort

of students with maximum potential to graduate and obtain the RRT credential.

Comments made on the survey support exposure to well-rounded and excellent faculty,

students, and alumni as a recruitment technique. Additionally, ensuring academic excellence

within the program and a positive reputation, with proof of this excellence displayed in digital

platform, is an excellent way to attract and interest potential students researching medical fields

to enter. Expansion of recruitment events that continue to highlight the positives aspects of

programs and introduce potential students to RTs that can further highlight the profession should

be considered a major part of an RT recruitment framework. When targeting students or

attempting to ensure that potential students are high quality candidates, utilizing persistence and

self-efficacy assessments can impact the decision-making process and strengthen the cohorts of

graduates entering the workforce.

Limitations

There are several limitations to this study. This study was a sample of convenience, and

the sample size was small, $n=68$. The sample of convenience and minimally effective sample

size make generalization difficult. Additionally, the causal-comparative design limited the ability

to randomize the sample. The RT program that was attended by the participants has high levels

of credentialling success and therefore there were a small number of participants that did not

pass the TMC, $n=8$, and CSE, $n=6$, on the first attempt. Additionally, the survey that was

conducted did not contain the full instrumentation intended. The last 10 questions of the CDSES were unintentionally omitted from the survey, eliminating the possibility of including that data in the logistic regression. The CDSES is broken into 5 scales and each scale was missing 2 questions on the survey. Descriptive statistics and trends were able to be analyzed with this data, however the full analysis was not able to be performed, as enough of the instrument was not completed to make definitive statements.

Recommendations for Future Research

In the future it is recommended that the research be replicated with both instruments in full. This will allow researchers to determine if the trends drawn from the data are consistent with valid and reliable complete instrument results. Additionally, it is recommended that this research is repeated with RT students from other academic programs nationwide. Research should be conducted in both baccalaureate degree RT programs and associate degree RT programs. Researchers should attempt to determine differences in recruitment between the degree types and will possibly have even numbers of participants that have passed the TMC and CSE on the first time and those who took more than once to pass the exams. Repeating the research with more variety of students and even groupings will allow the research to be more generalizable if the same results are found.

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Appendix A

[External] IRB-FY21-22-1198 - Initial: Initial - Exempt
do-not-reply@cayuse.com <do-not-reply@cayuse.com>
Thu 9/8/2022 2:09 PM
To: Fox, Rebecca Elizabeth ███████████████████; Hopkins, Treg (Doctor of Education)
████████████████

[EXTERNAL EMAIL: Do not click any links or open attachments unless you know the sender and trust the content.]

September 8, 2022
Rebecca Oppermann
Treg Hopkins
Re: IRB Exemption - IRB-FY21-22-1198 DETERMINING THE RELATIONSHIP BETWEEN FIRST TIMETHERAPIST MULTIPLE CHOICE EXAM HIGH CUT AND CLINICAL SIMULATION EXAM PASS RATES OFRECENT RESPIRATORY THERAPY GRADUATES FROM AN OHIO UNIVERSITY AND THEIR WELL-BEINGAND PERSISTENCE

Dear Rebecca Oppermann, Treg Hopkins,
The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA)regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.
Your study falls under the following exemption category, which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:104(d):
Category 2.(i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording).
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.
Your stamped consent form(s) and final versions of your study documents can be found under the Attachments tab within the Submission Details section of your study on Cayuse IRB.
Your stamped consent form(s) should be copied and used to gain the consent of your research participants. If you plan to provide your consent information electronically, the contents of the attached consent document(s) should be made available without alteration.
Please note that this exemption only applies to your current research application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued exemption status. You may report these changes by completing a modification submission through your Cayuse IRB account.
If you have any questions about this exemption or need assistance in determining whether possible modifications to your protocol would change your exemption status, please email us at irb@liberty.edu.
Sincerely,

G. Michele Baker, MA, CIP
Administrative Chair of Institutional Research
Research Ethics Office

Appendix B

From: Buck-IRB
To: ████████████████
Cc: ████████████
Subject: Study Determined Exempt for #2022E0924
Date: Tuesday, September 27, 2022 7:15:22 AM

09/27/2022
Study Number: 2022E0924
Study Title: DETERMINING THE RELATIONSHIP BETWEEN FIRST TIME THERAPIST MULTIPLE CHOICE EXAM HIGH CUT AND CLINICAL SIMULATION EXAM PASS RATES OF RECENT RESPIRATORY THERAPY GRADUATES FROM AN OHIO UNIVERSITY AND THEIR WELL-BEING AND PERSISTENCE

Principal investigator: Sarah Varekojis
Date of determination: 09/27/2022
Qualifying exempt category: #2b

Dear Sarah Varekojis,
The Office of Responsible Research Practices has determined the above referenced project exempt from IRB review. Please note the following about this determination:

 Retain a copy of this correspondence for your records.
 Only the Ohio State staff and students named on the application are approved as Ohio State investigators and/or key personnel for this study.
 Simple changes to personnel that do not require changes to materials can be submitted for review and approval through Buck-IRB.
 No other changes may be made to exempt research (e.g., to recruitment procedures, advertisements, instruments, protocol, etc.). If changes are needed, a new application for exemption must be submitted for review and approval prior to implementing the changes.
 Records relating to the research (including signed consent forms) must be retained and available for audit for at least 5 years after the study is closed. For more information, see university policies, Institutional Data and Research Data.
 It is the responsibility of the investigators to promptly report events that may represent unanticipated problems involving risks to subjects or others.

This determination is issued under The Ohio State University's OHRP Federal wide Assurance #00006378.
Human research protection program policies, procedures, and guidance can be found on the ORRP website.
Please feel free to contact the Office of Responsible Research Practices with any questions or concerns.
Jacob Stoddard
████████████████

Appendix C

Subject: Invitation to participate in a study about recruitment in RT education

Dear RT Graduate,

I am currently a PhD student at Liberty University. As part of my graduation requirement, we must complete a dissertation. The topic that I have chosen to research is recruitment in Respiratory Therapy (RT) education. I will be collecting demographic and survey data from recent graduates of the RT program in order to determine if there is a relationship between first time Therapist Multiple Choice (TMC) exam high cut and clinical simulation exam (CSE) pass rates and student persistence and well-being. Additionally, I will be asking recruitment strategies you experienced, in hopes of determining recruitment trends and developing a recruitment framework. I am writing to invite eligible participants to join my study.

Participants must have graduated from The Ohio State University Respiratory Therapy Program during the years 2016-2022. Participants, if willing, will be asked to complete an online survey (30 minutes). Participation will be completely anonymous and no personal, identifying information will be collected.

To participate, please click here
https://liberty.co1.qualtrics.com/jfe/form/SV_agZwQ6QxE7KBTFk

A consent document is provided as the first page of the survey. The consent document contains additional information about my research. After you have read the consent form, please click the [button/link] to proceed to the survey. Doing so will indicate that you have read the consent information and would like to take part in the survey.

If you have any questions that were not answered in this email, you are welcome to either call or email me with the contact information provided below

Thank you for your participation. I look forward to your response.

Sincerely,
Rebecca Oppermann Fox MS, RRT, RCP

If you would like to discuss questions regarding the rights of participants in this study as well as concerns related to this study with an individual who is not a member of the research team, please contact _____ at the Office of Responsible Research at 1-434-592-5530

Appendix D

Consent

Title of the Project: Determining The Relationship Between First Time Therapist Multiple Choice Exam High Cut And Clinical Simulation Exam Pass Rates Of Recent Respiratory Therapy Graduates From An Ohio University And Their Well-Being And Persistence

Principal Investigator: Rebecca (Oppermann) Fox, MS, RRT, RCP, Liberty University

Invitation to be Part of a Research Study

You are invited to participate in a research study. To participate, you must be a past graduate of The Ohio State University Respiratory Therapy Program, graduating in the years 2016-2022 Taking part in this research project is voluntary.

Please take time to read this entire form and ask questions before deciding whether to take part in this research.

What is the study about and why is it being done?

The purpose of the study is to determine how accurately first time TMC exam high cut and clinical simulation exam pass rates can be predicted from a linear combination of Lifestyle Index factors for recent Respiratory Therapy (RT) graduates in an Ohio university.

What will happen if you take part in this study?

If you agree to be in this study, I will ask you to do the following things:
1. Complete an online survey. The survey should take you approximately 30 mins to complete.

How could you or others benefit from this study?

Participants should not expect to receive a direct benefit from taking part in this study.

Benefits to society include gaining knowledge related to recruitment and retention in the field of Respiratory Therapy

What risks might you experience from being in this study?

The risks involved in this study include:
The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life

How will personal information be protected?

The records of this study will be kept private. Published reports will not include any information that will make it possible to identify a subject. Research records will be stored securely, and only the researcher will have access to the records. Participant responses will be anonymous. Data will be stored on a password-locked computer and may be used in future presentations. After

three years, all electronic records will be deleted.

How will you be compensated for being part of the study?
Participants will not be compensated for participating in this study.

Is study participation voluntary?
Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University or The Ohio State University. If you decide to participate, you are free to not answer any question or withdraw at any time prior to submitting the survey without affecting those relationships.

What should you do if you decide to withdraw from the study?
If you choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

Whom do you contact if you have questions or concerns about the study?
The researcher conducting this study is Rebecca (Oppermann) Fox. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her at ██████████ or ████████████████████ You may also contact the researcher's faculty sponsor, Dr. Treg Hopkins at ████████████████.

Whom do you contact if you have questions about your rights as a research participant?
If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email at irb@liberty.edu.

Disclaimer: The Institutional Review Board (IRB) is tasked with ensuring that human subjects research will be conducted in an ethical manner as defined and required by federal regulations. The topics covered and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.

Your Consent
Before agreeing to be part of the research, please be sure that you understand what the study is about. You can print a copy of the document for your records. If you have any questions about the study later, you can contact the Rebecca (Oppermann) Fox using the information provided above.

By choosing to continue with this survey you acknowledge that: *I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.*

Appendix E

Subject: Reminder to participate in a study about recruitment in RT education

Dear RT Graduate,

I am currently a PhD student at Liberty University. As part of my graduation requirement, we must complete a dissertation. The topic that I have chosen to research is recruitment in Respiratory Therapy (RT) education. I will be collecting demographic and survey data from recent graduates of the RT program in order to determine if there is a relationship between first time Therapist Multiple Choice (TMC) exam high cut and clinical simulation exam (CSE) pass rates and student persistence and well-being. Additionally, I will be asking recruitment strategies you experienced, in hopes of determining recruitment trends and developing a recruitment framework.

This is a reminder email to complete the survey pertaining to recruitment in RT education. I appreciate your participation in this study.

Participants, if willing, will be asked to complete an online survey (30 minutes). Participation will be completely anonymous and no personal, identifying information will be collected.

To participate, please click here to complete the survey:
https://liberty.co1.qualtrics.com/jfe/form/SV_agZwQ6QxE7KBTFk

A consent document is provided as the first page of the survey. The consent document contains additional information about my research. After you have read the consent form, please click the button to proceed to the survey. Doing so will indicate that you have read the consent information and would like to take part in the survey.

If you have any questions that were not answered in this or the prior email, you are welcome to either call or email me with the contact information provided below

Thank you for your participation. We look forward to your response.

Sincerely,

Rebecca Oppermann Fox MS, RRT, RCP

Appendix F

RT Graduate	Age (yrs)	Gender	Strategies	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24
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Survey Data Collection Spreadsheet Continued

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