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The Path We Tread: Honoring Dr. Sallie Tucker Allen

Dr. Sallie Tucker Allen is an American treasure and is a trailblazer in creating a cadre of minority nursing scholars and leaders in nursing education. Dr. Tucker Allen's seminal work, *Directory of Minority Nursing Faculty*, provided a background for identifying minority nursing faculty in the United States. Dr. Tucker Allen firmly believed that minority faculty needed a way to connect and support each other to achieve extraordinary goals for advancing nursing education and healthcare for all. With this desire, Dr. Tucker Allen organized the Association of Black Nursing Faculty, Inc. (ABNF) in 1987.

Over the past thirty years, ABNF has been instrumental in mentoring hundreds of minority nursing faculty members through development in scholarship including writing for publication and writing research and teaching grants for external funding. Also, ABNF provided an opportunity to give voice to our shared values; demystifying the tenure process, imagining exciting and ennobling possibilities, looking inward and outward for innovation in nursing education, fostering trusting and collaborative relationships, and celebrating our individual and collective achievements. ABNF paved the way for several minority nurses to receive appointments as deans, associate deans, assistant deans, directors and tenured faculty members. Infusion of these nursing faculty have transformed nursing education across the United States. As a result, thousands of nursing students have been impacted with the opportunity to learn in more diverse academic settings.

Three themes characterize her achievements and passion for social justice. First, she consistently demonstrates a commitment for *making a way out of no way*. Hence, the establishment of Tucker Publication to facilitate the publication of articles written by minority nurse scholars. These publications, The ABNF Journal, Minority Nurse Newsletter, and The Journal of Cultural Diversity: An Interdisciplinary Journal, created opportunities for minority nurse scholars and scholars from other disciplines to publish articles that address issues and research that matter to minority populations and communities. Early on, in addition to research and program related articles; Dr. Tucker Allen had a vision that nurse scientists needed to develop and test models related to nursing phenomena to advance nursing as a science. Hence, she published the *Journal of Theory Construction and Testing (JTCT).* Since its beginning, with the inaugural editor and scholar, Dr. Margaret Beard, The *JTCT* has published over 200 theory papers.

A second theme is being true to oneself. Dr. Tucker Allen is always herself. She knows who she is and is always authentically present in meeting with others. A third theme is being disciplined. Her commitment to being discipline was evident in her academic preparation. Dr. Tucker Allen graduated Magna Cum Laude with her Bachelor of Nursing Science from Hampton University, Master of Science from Hunter College and her Doctor of Philosophy in Administration and Policy Studies from Northwestern University.

Dr. Tucker Allen's journey as An American Treasure and our living legend. commitment to making a way out of no way, being true to herself and being discipline shaped our beloved Dr. Tucker Allen's journey as An American Treasure and our living legend.

Nursing Faculty Support for a Multitude of Stakeholders

A recent publication from 2021 stated, "Preparation of new nursing educational leaders should be deliberate as all organizations need succession planning. It is neither practical nor ethical to place people in positions of significant responsibility without preparation (Johnson et al., 2021). In the article, *Mentoring Nursing Faculty of Color toward Leadership Excellence: A Concept Analysis*, lead author Dr. Johnson highlighted the importance of mentoring Black, Indigenous, and Nursing Faculty of Color (BINFOC) nursing faculty in preparation for future leadership positions. This concept analysis describes the importance and implications of mentoring to the development of BINFOC and the reciprocal impacts on those servicing as mentors. The authors stress the need to dedicate time and resources to the formal development, support, and sponsorships of the grooming of minority leaders in nursing academic leadership. The stakeholders emphasized for support for nurse leaders in this scholarly article are peer nurse faculty and nursing leaders.

Dr. McNeal and colleagues focused their study on students and the patients that they care for as stakeholders. The article, *The Simulated Virtual Healthcare System Model (SVHSM) Interprofessional Education Project,* shared the satisfaction survey results after implementing a public and community health virtual and augmented reality simulation geared towards undergraduate nursing students working as members of interdisciplinary. The impetus for this study was two-fold, including the desire to expose pre-licensure students to interdisciplinary educational experiences and to prepare the students to care for patients in the community and public health settings. Simulation, using virtual and augmented reality, can be engaging in providing students valuable experiences working in interprofessional teams to care for patients. A similar study by Jallad & Isik (2021) confirmed the effectiveness of using virtual simulation in nursing education to strengthen learning outcomes in content knowledge retention, honing clinical skills, and increasing learning satisfaction in the learning process.

The study by Dr. Rhagnanan-Kramer and the team examined the interface between nurses and technology and the resulting impact on nursing practice, nurses' well-being, and patients' risks and outcomes. According to Matinolli et al. (2020), the rapid and constant changes in healthcare technologies have challenged healthcare providers' knowledge and confidence in using new technology. However, it also poses risks to patients' care and outcomes. This team recognized the limited investigation on the impact of numerous technologies infused in daily patients, the burden to the nurses, the cognitive and physical workload for the care providers, and the actual and potential risks to patients' outcomes.

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Editorial: Kechi Iheduru-Anderson DNP, RN, CNE, CWCN – Guest Editor & Chair of Research

Onboarding, Covid-19 Vaccine uptake, Race and Pain management, and Stress management in nursing education: Collaborative scholarship in action

Evidence indicates that vaccines are critical in lowering disease-specific mortality rates. Studies show African Americans were more likely to resist the Covid-19 vaccination than non-Hispanic whites (Moore et al., 2021). Dr. Shelley A. Johnson and colleagues from Florida A&M University completed a scoping review on COVID-19 Vaccine Hesitancy among Blacks and African Americans in Florida. They highlighted the disproportionate impact of the COVID-19 pandemic on African Americans in Florida and other parts of the United States. African Americans make up a larger share of COVID-19 cases, hospitalizations, and deaths in Florida compared to their share of the overall population. According to data from the Florida Department of Health, as of September 2021, African Americans represented 16% of Florida's population but accounted for 24% of COVID-19 cases and 19% of COVID-19 deaths. This disparity has been attributed to various factors, including underlying health disparities, such as higher rates of chronic diseases like diabetes, hypertension, and obesity among African Americans and unequal access to healthcare and economic opportunities.

A second article revealed onboarding and orientation programs are critical for integrating new employees into an institution. However, research on onboarding advanced practitioners is limited. Professors Tracie Clisby, Kashica J. Webber-Ritchey, and colleagues from City Colleges of Chicago-Malcom X College and DePaul University, School of Nursing in Chicago, Illinois, completed a qualitative descriptive study to explore the existence and the structure of formal onboarding and orientation practices of advanced practice provider working in the academic medical center in the emergency department across metropolitan United States cities. They found a lack of a standard for onboarding advanced practice providers across settings. With expanding Advanced practitioner responsibilities, the authors emphasized the need to formalize the standard for onboarding APPs. Standardized onboarding processes can ensure that all newly hired APPs receive consistent information and training, regardless of the practice site. The authors argue that effective onboarding and orientation programs can help improve retention rates, increase job satisfaction, and promote better patient outcomes.

Authors found pain to be a universal experience and a vital indicator of an individual's health status. Despite its importance, previous research suggested that racial biases significantly impact how providers manage patients' pain along racial lines (Hoffman et al., 2016). Many providers were more likely to believe White patients' descriptions of their pain than Black patients and more likely to provide inadequate pain medications and longer wait times to Black patients than White patients. Raegan Bishop of the University of Southern Mississippi and colleagues examined the effect of a patient's race on pain perception and treatment by student nurses. The authors investigated whether a patient's race affects how nursing students perceive and treat patients' pain, using an experimental research design with one independent variable, the patient's race, with two levels (either Black or White).

Finally stress among nursing students is rated moderate-to-high (Labrague et al., 2017), directly or indirectly impacting learning, well-being, and academic performance. Nursing students must be equipped with effective coping strategies to manage stressors to support their learning and reduce the impact of stress on their health and retention in the nursing program. In their contribution to the current issue, Dr. Oluwatoyin Okafor, Assistant Professor at Albany State University, Darton College of Health Professions, and colleagues utilized a quantitative, quasi-experimental, one-group pretest-posttest design to evaluate the effectiveness of mindfulness meditation as a stress reduction intervention on the perceived stress levels of 20 first-year undergraduate nursing students. The results indicated that six weeks of mindfulness meditation effectively reduced the participants' perceived stress levels. The magnitude of the difference between the pretest and posttest stress scores was significant.

The contributions of the authors to the current issue indicate the variety of specialty areas of scholarship. To facilitate vaccine uptake in African American Communities, a clear, complete, and accurate message about the vaccine developed in collaboration with state agencies and local partners helps to build trust and acceptance. Without adequate coping strategies to manage stressors, nursing students may face difficulties in their learning process and negative impacts on their health and retention in their nursing program. Therefore, effective stress coping strategies must be introduced to manage stressors among nursing students. Onboarding and orientation for advanced practice providers are critical for the transition into practice. They should be formalized to promote workplace integration and retention—racial bias related to pain perception and treatment results in health inequity and poor health outcomes. Therefore, understanding and addressing such biases during pre-professional training is critical for future healthcare professionals and for eliminating health disparities. Findings from all the studies have implications for future research on how best to address these issues within nursing education programs and healthcare services.

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Onboarding and Orientation Programs for Advanced Practice Providers (APPs) in Metropolitan Academic Medical Center Emergency Departments

Abstract

Upon employment, the advanced practice provider (APP) undergoes an onboarding and orientation process, increasing employee satisfaction and retention. The purpose of this qualitative descriptive study was to explore the existence and the structure of formal onboarding and orientation practices of APPs working in academic medical center (AMC) EDs across metropolitan United States cities. From September 2021 to November 2021, APP leaders (n = 5) participated in semi-structured interviews. Thematic and content analysis was used and revealed that four of the five Midwestern AMC EDs do not have formal onboarding and orientation programs for newly hired employees. Study participants working in EDs identified an absence of formal orientation and onboarding. However, the informal current onboarding and orientation processes used are customized to the individual employee enrolled in a fellowship. Results of this study may create formalized onboarding and orientation structures in AMC EDs that will benefit APPs.
Keywords: Advanced Practice Provider, Onboarding, Orientation, Emergency Department, Academic Medical Centers

Introduction

The COVID-19 pandemic has shed light on the stark structural and systematic racial inequities impacting the health of communities of color according to the Centers for Disease Control and Prevention, 2021). The growing advanced practice provider (APP) workforce is well-positioned to manage complex patient care situations (Arthur et al., 2020). Institutions often employ an APP in the emergency department (ED). In the United States (US) academic medical center (AMC) EDs, the presence of APPs has increased (Carpenter et al., 2021). This expansion of APPs is attributed to their in-depth knowledge, skills, and abilities to achieve positive outcomes for patients through decreased hospital length of stay, lower total healthcare costs, improved continuity of care, decreased and increased job satisfaction among physicians and staff nurses (Arthur et al., 2020; Katz et al., 2020; Morgan et al., 2019).

At the beginning of employment, the onboarding and orientation process is initiated to prepare newly hired APPs for their position. In this study, the definition of orientation is derived from Wallace (2009) which is formal training on the required tasks provided in the job description, the rationale for each task, and the required actions to complete each task. Orientation helps employees increase understanding of organizational fundamentals, which is why orientation programs must be grounded in the organizational goals and mission (Wallace, 2009). In this study, the definition of onboarding is the process of integrating employees into an organization to quickly make them effective and productive team members (Bauer, 2013). Onboarding provides APPs with the tools to aid in acclimation to their jobs quickly to function effectively in an organization (Grek et al., 2022; Kumar & Padney, 2017). Structured onboarding and orientation programs can improve employee satisfaction, retention, and acclimation to the organization's culture and values (Grek et al., 2022; Rush et al., 2021; Weinstock, 2015). Evidence on the best practices in orientating and onboarding specialized roles like APPs in institutions is limited (Morgan et al., 2020; Ricker et al., 2021).

Background

Historically, novice and newly hired APPs in the ED, including US AMC EDs in the Chicago area, do not have a formal onboarding and orientation program. Kumar and Padney (2017) found that employees that do not feel welcomed as soon as the date of employment have an increased chance of leaving during the first year. Higher provider job satisfaction increases the retention of APPs and decreases intent to leave current positions (De Milt et al., 2010). Grek et al. (2022) found that a lack of formal orientation and onboarding contributes to

dissatisfaction and high turnover rates for APPs. Many EDs in AMCs and community hospitals employ APPs to be involved in the care provision of patients with acute illnesses and complex needs. According to a secondary analysis of ED data from a national emergency medicine group from 2014 through 2018, one-in-six patients and one-in-eight ED patients received care from a physician assistant (PA) or nurse practitioner/advanced practice nurse (NP/APN) in 2016 respectively with over 20,500 APPs practicing emergency medicine in 2018 (Pines et al., 2014).

Wolf et al. (2017) identified challenges with defining the capabilities and competency of the APN role in the EDs creating difficulty in communicating about onboarding when discrepancies exist in how to define the role and its elements. In addition to the lack of a comprehensive definition of the APN role in EDs, study participants expressed concern with the transition from student to practitioner and noted the guidelines from the American College of Emergency Physicians (ACEP) call for supervised orientation programs with return demonstration for APPs practicing in the EDs (Wolf et al., 2017). A search of the literature revealed the need for formalized onboarding and orientation programs that include support/mentoring, role definition, and a streamlined onboarding and orientation process (Grek et al., 2022; Goldschmidt & Rust, 2011; Morgan et al., 2020).

Study Purpose

Given the call by ACEP for APPs to have a supervised orientation, extensive research on onboarding and orientation programs is needed. Despite the growing numbers of APPs practicing in emergency medicine, many APPs have identified not undergoing formal orientation and onboarding for their role in the ED. This study aims to advance nursing practice by focusing on how to define the role of APPs in the provision of care to ED patients across their lifespans with the implementation of onboarding and orientation practices. Specifically, identifying distinct orientation and onboarding programs to support APPs is crucial (Ricker et al., 2021). Therefore, the purpose of this qualitative study is to explore the existence and the structure of formal onboarding and orientation practices of APPs working in AMC EDs across the metropolitan United States (US) cities.

Methods

Study Design

A qualitative descriptive study which is theory-generating in its design was conducted enabling researchers to adjust to information as it is gathered and gain an understanding of the whole situation easier (Polit, 2016). Semi-structured one-on-one interviews were conducted by the primary investigator (PI), an APP and graduate student working in an AMC ED with more than ten years of experience from September to November 2021. All interviews were completed via Zoom platform which provided a web-based audio recording of the interview. The study team consisted of the PI and doctoral committee members including one PhD-prepared nurse scientist and three DNP-prepared advanced practice nurses serving in nursing education roles at the time of data collection. Four of the study team members, including the PI, are expert Emergency Department Nurse Practitioners with five or more years of experience working at a metropolitan institution. Under the direction of the study team, the PI conducted participant recruitment, data cleaning, and data analysis.

Study Participants

Study participants initially sourced from a list of the AMCs that are member hospitals and health systems of the American Association of Medical Colleges. The PI contacted institutions and personnel from each region of the US to get a representative sample willing to participate in the research. The PI determined study eligibility criteria for participants by initial email contact based upon the following inclusion criteria: APP who self-identify as a leader (the person responsible for supervision and oversight of the APPs), employment at an AMC ED, able to speak and understand English, and consented to be audio-recorded during the interview process.

Data Collection

Participants completed one virtual semi-structured interview via Zoom platform. Zoom offers the ability to communicate in real time via computer, tablet, or mobile device to record securely and store recordings (Archibald et al., 2019). Each interview lasted from 20 to 30 minutes. The PI interviewed study participants using an interview guide developed by the PI which was reviewed and approved by research team. The interview guide (Figure 1) included open-ended questions, which were based on PI experience. A DNP-prepared ED nurse practitioner performed the interview guide's content validity. Each interview began with the collection of characteristics about the current employer, including location, type of institution, size, number of patient beds or treatment areas, confirmation of APPs in ED, and number of APPs proceeded to questions regarding the institution's onboarding and orientation program. During interviews, no formal field notes were not taken. Discussion on data saturation occurred during the meeting with the study team. The PI conducted a total of six interviews.

Ethical Considerations

Data collection processes, procedures, and formal study documentation received approval from Institutional Review Board (Research Protocol #IRB-2021-359) at DePaul University in Chicago, Illinois, US on the exempt category. Participants completed the study protocol voluntarily and received no incentive paid for their participation. Implied consent occurred prior to formal interview with participants. A study information sheet was emailed to participants and the PI read a brief statement at the start of each interview reviewing the elements of the consent and study. Since interviews focused on the person managing or overseeing the APPs, there is a small risk to the APPs of disclosure because they are subject to the information the supervisor gives without consenting to the study themselves. The study team intentionally developed the interview guide to collect minimum identifying information for study participants beyond the individual's clinical role and credentials. Anonymous data were stored securely with a password-protected file. A secure web-based application was used for audio recordings. Data were only accessible to the PI and study team. Before beginning study, the PI completed the Collaborative Institutional Training Initiative (CITI) human subjects training.

Data Analysis

The PI reviewed the audio recordings of the interviews of each participant to identify and derive themes from the data collected. Thematic and content analysis were used in combination to allow data to be qualitatively analyzed and quantified as needed, providing richer and detailed insights on a phenomena (Doyle et al., 2019). The PI categorized and reconstructed data into meaningful patterns among the categories to identify the ideas and generalized concepts, using initial and focused coding (Polit, 2016). Initial coding allowed for large pieces of data to be studied and an understanding of the problem from the participant's perspective (Polit, 2016). Upon a consensus on the initial coding, formal coding were completed (Polit, 2016). The PI reviewed interview transcripts for accuracy. Themes were discussed among the study team. The study team excluded interview data from one study participant given that the study participant did not meet the study eligibility criteria. This paper presents the interviews with five participants.

Results

A total of five study participant (n = 5) participated in interviews, comprising four males and one female. Participants were APP leaders, individually responsible for oversight of APPs in AMC EDs in the US in the Midwestern region. The AMC hospital demographics had a full bed range of 175 to 700, and ED beds of 36 to 121, with one institution not reporting ED beds. The average number of total beds consisted of 405, whereas the total ED beds were 48 across the five institutions. Among study participants, APP leaders held various titles for their roles that, included lead APP, practice manager, advanced practice clinician (APC), and adult specialties director. Study participants currently practiced at an academic hospital. Participants' licensed titles included Physician Assistant (PA), Acute Care Nurse practitioner (ACNP), Adult Nurse Practitioner (ANP), Family Nurse Practitioner (FNP), and Emergency Nurse Practitioner (ENP).

Study participants reported employment at institutions that utilize a wide range of healthcare providers, from residents to attending physicians and APPs consisting of NPs and PAs. Study participants reported institutions employing one type of APP (NP or PA) or employing a mix of APPs. For instance, institutions employed 47 NPs and 52 PAs as healthcare providers for ED patients. Study participants reported working with APPs that primarily cover one leading AMC site, and one institution required the APPs to rotate to the community ED within the health system.

Most study participants reported the absence of formal onboarding and orientation programs for newly hired employees, except one study participant reported the presence of a formal structure for onboarding and orientation. Most institutions with informal ED programs adjust to the individual practitioner's needs. In 2020, a Midwestern ED formal program was developed in which the program is constantly evolving. Most study participants reported that EDs had variations of informal structures with training requirements based on each practitioner. Institutions used hospital privilege credentialing checklists to shape orientation and paired new employees with experienced providers to enable learning along the way. Institutions administered written evaluations at some time point during the orientation and onboarding period. Written evaluations focused on input from colleagues that the newly hired employee shadowed or had worked shifts with the newly hired employee. Timeframes of orientation and onboarding programs varied considerably among the study participants. The level of APP experience influenced the duration of programs. The shortest timeframe reported was "a few shifts", equivalent to four to five. The most extended timeframe reported was 12 weeks and one-year fellowships. APPs working at an institution with a fellowship program as a form of onboarding and orientation reported participated in the onboarding and orientation process because this was required for newly hired employees. Many programs broke down the timeframes differently between experienced providers, new-to-ED APPs, and newly graduated APPs. Some

orientation programs also included one to two weeks of general hospital and advanced practice service orientation. One study participant described the institution's joint fellowship program with a local university which was this institution's primary source of provider recruitment and was considered part of the onboarding and orientation as the employee transitioned to full-provider status, representing the only formal program. Additionally, newly hired employees at this institution that did not participate in the hospital's fellowship were placed into "tracks" based on prior APP or ED experience with orientation supervision until APP leader evaluations indicated readiness to progress to the next level of independent practice. Non-fellowship programs lasted 12 weeks for newly graduated APPs.

Institutions considered their orientation and onboarding programs effective when the employee could perform at the same level as current employees that provide care to patients with complex health needs and the ability to see patients independently. Moreover, some facilities measured the volume of patients seen independently after orientation, expressed in the number of patient visits. The APP leaders reported positive colleague feedback as a critical indicator for the conclusion of orientation and onboarding. In contrast, orientation timeframe served as a secondary indicator, and self-input from the newly hired employee regarding their readiness to conclude orientation served as a third indicator.

Study participants described their programs as effective in bringing on productive and functioning APPs in the EDs, and "letting an employee go" was very infrequent. Study participants acknowledged that changes to their respective onboarding and orientation structure are necessary to make it more formal. Some of the study participants remarked, "yeah, we've been doing this for a few years", and described the methods currently utilized for onboarding and orientation as practical despite the informal structure. One study participant reported how the introduction of the idea to implement a binder to keep track of orientation and onboarding was met with opposition and remarked "it's a good guide but we don't need it" to help guide the onboarding of APP providers. Participants reported a desire for more hospital orientation or involvement in hospital onboarding activities. Two study participants reported tailoring the orientation and onboarding process to the new graduate was needed. Most study participants expressed the need for careful review of ED procedural information and completion of several main credentialed ED procedures during orientation and onboarding be a requirement for newly hired employees.

Discussion

This study aimed to explore and describe the onboarding and orientation practices of APPs working in AMC EDs in the US. Onboarding and orientation programs vary; informal onboarding and orientation programs for APPs are standard in AMC EDs. In line with the PI's personal experience regarding the onboarding of APPs, APP leaders reported not having formal onboarding or orientation at points in their careers as an APP. Study findings add to the current knowledge on the onboarding and ongoing process of APPs in EDs.

APPs need support transitioning into their role in the ED, in which organizations are working on implementing formal onboarding programs and fellowships (Morgan et al., 2020). Although there are current efforts to identify a formalized onboarding and orientation process, these efforts are met with difficulty because of the differences in training and roles of US APPs. Lackner et al. (2019) found that a lack of structured support for the NP role negatively affected the transition to practice during the first year of clinical fellowships for APPs. While PAs often complete emergency medicine rotations as part of the standard PA curriculum, NP licensure and training vary and may not include emergency medicine rotations unless provided in a formal Emergency Nurse Practitioner program (ENP) or chosen as a specialty rotation in the family nurse practitioner (FNP) or acute care nurse practitioner (ACNP) program. A pilot study among APPs identified the challenges of integrating APPs into the healthcare team due to confusion regarding APP skills, training, and knowledge of expected role responsibilities (Barrett & Wright, 2019). Barrett and Wright (2019) described APP isolation and lack of team preparation for newly hired APPs as another concerning issue. APP leaders described the importance of a formal onboarding and orientation program in place and recognized how despite the informality of the program, employees are productive in almost situations.

In this study, APP leaders expressed training and licensure as drivers in selecting of a provider because this factors in on the institution's ability to integrate and train employees smoothly to be effective and productive at the institution. APP providers chosen for employment at a particular facility was often reflective of the APP leadership, with a predilection towards those of the same licensure type of NP or PA. The hiring process can be more straightforward by assessing and evaluating a new provider during the orientation and onboarding process based on a formalized process. During this process, a structured onboarding program to promote effective and efficient care provision to ED patients can be designed to meet the needs of the newly hired APPs.

A formal onboarding and orientation program should include competency tasks/skills for the public institution and the department where the employee will be

working. In this study, APP leaders desired greater involvement for employees in structured hospital orientation to introduce other aspects of the organization system beyond the ED. Similarly, Grek et al., (2022) identified that structured onboarding and orientation could help with the successful integration of newly hired APPs into the organizational culture and system. Barnes (2015) study found an association between formal orientation and more accessible and more efficient transitions to practice, yet only 33% of participants reported receiving formal orientation. Newly hired APPs can integrate into the organizational mission and values when provided with formal orientation, which may increase the likelihood of staying at the institution in a highly specialized role (Weinstock, 2015). Clinical turnover is costly for organizations (Grek et al., 2022; Morgan et al., 2020), with an estimated cost being over the average APP salary, which is estimated at $92,956 to $114,971 in 2022 ("Advanced practice nurse salary", 2022).

Study findings highlight the desire for a more formalized program to establish a common base of ED skills for credentialing APPs and promoting competence in performing skills at various timeframes during the onboarding process. The scope of practice for APPs is expanding with current APPs practicing with more autonomy and increased productivity expectations than in the past which has increased the need for effective and efficient onboarding (Morgan et al., 2020). Often credentialing skills checklists provide a source of commonality among various APPs in an ED regardless of educational training, prior experience, and current area of practice or specialty. Skills addressed in the credentialing checklists are consistent for newly hired APPs with ongoing professional reviews with APP leaders where additional skill competencies are added to the checklists as time and experience of the APPs allow. Depending on training and experience, APPs may not be competent in the required skills to successfully transition into practice in the ED. There is a downside to using the credentialing checklist at the start of employment. APPs often do not receive on-the-job procedural training until the first two years under supervision or after attending conferences and procedure boot camps (Katz et al., 2021).

Implications on Nursing Research and Clinical Practice

Our study findings have implications for the development of formalized onboarding and orientation structures for APPs providing care to ED patients. APP leaders interviewed described the value of informal orientation and onboarding programs for new employees at their institution. Among the five institutions, only one institution used a formal program which was relatively new, and in use for under two years. The average time frame for newly graduated APPs to complete onboarding and orientation was 12 weeks, with the onboarding and orientation process at times implemented over a "few" shifts with the expectation of functioning like other experienced team members. APP leaders identified the need to examine existing onboarding and orientation programs and updated them accordingly for more structure. APP leaders discussed how some institutions had not initiated the work in defining what a structured onboarding and orientation program should entail. Additionally, APP leaders described how a common approach to a formalized onboarding and orientation process that focuses on proficiency in critical skill competencies is warranted.

Future work is necessary to expand and solidify the role of APPs in providing care to ED patients across their lifespans (Goldschmidt et al., 2011; Chaney et al., 2022; Ricker et al., 2020). The future of APPs within the ED can be improved through a more in-depth dive into onboarding and orientation processes during the early development, paying close attention to the knowledge content and learning objectives of formal orientation in other words, the distinguished tasks that require competency and proficiency, should be included in onboarding.

There are several strengths of this study. First, APPs provide multifaceted contributions to professional practice such as managing a variety of primary care and specialty patient populations across the care continuum (Arthur et al., 2020). Second, study findings have implications to optimize the critical and essential APP workforce. Third, study findings reinforce the need for formal onboarding and orientation programs for the APP workforce in AMC EDs and clarity on how these programs should be logistically structured to provide adequate support in successfully transitioning into practice (Arthur et al., 2020). Specifically, orientation and onboarding has high potential to promote the successful integration of newly hired APPs in AMC EDs. Formal onboarding is an integral step in retaining employees in organizations, significantly beyond the first year of employment (Kumar & Padney, 2017). Onboarding requires the support of the organization and human resources. Proper onboarding should be comprehensive, extending from the pre-employee period phase to regularly during the 30-, 60-, and 90-day period into employment (Kumar & Padney, 2017).

While the focus was on formal onboarding and orientation programs for APPs in Metropolitan academic centers, this study is limited to APP leaders working in Midwestern states. Therefore, limiting the generalizability of findings beyond Midwestern states. We recommend future studies examine the formal onboarding and orientation programs among a larger sample of APPs

working in AMC EDs across metropolitan US cities. This future work should include a description of how the orientation plan and onboarding process are structured in designing comprehensive onboarding and orientation processes to best meet the needs of these providers (Langley et al., 2018).

Conclusion

This qualitative exploration of the onboarding and orientation process in AMC EDs for newly hired APPs discusses how the path to integrating new employees is not a straightforward scripted path and is individualized based on one's prior training, experience, and clinical practice within health institutions. Retention of highly skilled and licensed employees like APPs is heavily influenced by the onboarding and orientation process. It directly impacts employees' decision to remain in their position in the coming years. When APPs resign from a position, healthcare institutions face costs of $84,000 to $200,000, and this results in lost revenue each year (Dean Martin, 2020). An institution with an established orientation and onboarding program conveys that new employees are worth the investment. Additionally, it conveys that employees are valuable to the team, department, and institution. A mutual commitment to providing the best care to patients can be achieved when APPs feel vested, heard, and communicated.

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Figure 1.

Onboarding and Orientation of Advanced Practice Provider Leaders Semi-Structured Interview Guide

1) Does your ED have a formal onboarding and orientation program for APPs who are new to your facility or department?

   If yes:

   a. Tell me more about how your program is structured.
   b. What is the length of your program?
   c. Who is responsible for performing the onboarding and orientation for new APPs in your ED, and tell me about their role?
   d. Can you tell me more about how your facility gauges APPs' successful completion of the onboarding and orientation program and readiness for practice at your facility?

   If no:

   e. How do you orient and onboard new APP employees with no formal structure?
   f. What is the timeframe of onboarding and orientation without a formal program?
   g. Who is responsible for overseeing new APPs in your ED, and tell me about their role?
   h. Can you tell me more about how your facility gauges when APPs are ready for practice in your ED?

2) Do you feel APPs are prepared for practice in your ED with the current structure?
3) What changes to your Onboarding and Orientation process are needed?
4) Finally, what further comments related to academic medical center ED APP onboarding and orientation would you like to share with us?
   a. and readiness for practice at your facility?

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COVID-19 Vaccine Hesitancy among People of Color: Meeting the Needs in Florida

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Abstract

The COVID-19 pandemic disproportionately impacted African-Americans (AA) in Florida compared to Florida's general population. Reports indicate that African-Americans suffer more from severe disease, adverse physical, mental, and social burdens, as well as higher rates of death. Despite evidence that the COVID-19 vaccine can effectively protect from and prevent coronavirus infection, a significant number of African-Americans resist COVID-19 vaccination. Per the Kaiser Family Foundation, 44% of AA within eligible groups have been vaccinated. Barriers to a successful vaccination campaign include access, misperception, mistrust, health literacy, and misinformation. As a result, outreach efforts to build COVID-19 vaccine confidence and mitigate disparities must consider trust in the vaccine, the provider who administers it, and processes and policies leading from vaccine development to the recommendation for its use. Vaccine acceptance outreach must consider that access and ease of getting the vaccine are crucial. Other factors that may impede vaccine acceptance include side effects profile, efficacy, safety, and cost. A clear, complete, and accurate message about the vaccine, developed in collaboration with state agencies and local partners, helps to build trust and acceptance. This review of the literature was conducted to identify specific barriers to vaccination uptake within Black and African-American communities and strategies to mitigate vaccine hesitancy and increase vaccine confidence to assist residents of northern Florida. Articles were compiled from the following four health-focused databases, Medline Complete Database, CINAHL, Nursing@OVID, and PubMed, and resulted in the study of 25 scholarly articles.

Keywords: *COVID-19, Vaccine, Hesitancy, Black, African-American*

Introduction

During the COVID-19 pandemic, vaccine hesitancy was a significant issue in the work to vaccinate the Black and African-American populations against the severe effects of COVID-19 (Higginson et al., 2021; Carroll et al., 2022; Choi et al., 2022). Vaccine hesitancy is defined as a person's reluctance to accept vaccines or immunizations (MacDonald, 2015; Higginson et al., 2021; Troiano & Nardi, 2021; Ergün et al., 2022). Vaccine hesitancy persists within Black and African-American communities due to the lack of trust within the healthcare system and in clinical research owing to painful historical traumas such as the Tuskegee syphilis study (Warren et al., 2020; Jones, 2021; Ignacio et al., 2022). Vaccine hesitancy prevents the benefits of herd immunity when populations are vaccinated (Higginson et al., 2021; Okoro et al., 2021; Ergün et al., 2022). This manuscript aims to provide a review of the literature to identify barriers

to vaccination uptake within Black and African-American communities and strategies to mitigate vaccine hesitancy to increase vaccine confidence among the target population in Florida. Curating the information on how to combat vaccine hesitancy can assist other public and community healthcare providers in increasing the life expectancy and quality of life for those who receive the COVID-19 vaccination and avoid severe illness and death.

Background

The 2019 Novel Coronavirus (COVID-19), caused by a severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is a zoonotic virus known to infect humans that causes mild to severe respiratory illnesses such as pneumonia and acute respiratory distress syndrome (Ahn et al., 2020). The primary transmission mode, person-to-person, is exposure to respiratory fluids (droplets and aerosol particles) infected with SARS-CoV-2. An essential mechanism of this disease is that SARS-CoV-2 targets cells, through the viral structural spike (S) protein, binds to the host cell angiotensin-converting enzyme-2 receptor, facilitating virus entry and replication (Gheblawi et al., 2020; Sharma et al., 2021; Wiersinga et al., 2020). Since the first reports of COVID-19 cases in Wuhan, China, in late December 2019 through October 2020, the number of confirmed cases of COVID-19 increased significantly to 36.5 million, with over one million lives lost {Center for Disease Control and Prevention (CDC), 2020; World Health Organization (WHO) (CDC, 2020; WHO, 2022). Additionally, several viral mutations and genetic recombination have led to the extensive lineage of the SAR-CoV-2 virus with over ten (10) variants, Omicron being the current variant of concern (CDC, 2022).

Due to its versatile transmission methods, COVID-19 has spread over vast regions, reaching over 213 countries and territories. The World Health Organization reports over 537 million confirmed cases and over 6 million deaths globally (WHO, 2022). Within the United States, cases reached over 86 million and tallied over one million deaths as of June 2022. Since the outbreak of the pandemic in the United States, Florida has been a hotspot for the transmission of the virus (Jones et al., 2021). Florida alone has reported approximately 6,67,570 COVID-19 cases as of July 2022 (CDC, 2022).

Furthermore, the COVID-19 pandemic has revealed health disparities across racial and ethnic groups in the United States. Racial trends have shown that COVID-19 infections are more likely to affect African-Americans and Hispanics than non-Hispanic whites. People of Color in Florida represent approximately 47% of the population compared to Whites at 53%. The distribution of COVID-19 cases has impacted people of color in Florida, accounting for 56% of confirmed cases, 44% of deaths, and 46% of hospitalizations, compared to Whites (KFF, 2022). Additionally, studies have demonstrated that African-Americans are twice as likely to be hospitalized from COVID-19 compared to non-Hispanic Whites (Akintobi et al., 2020; Cyrus et al., 2020). Despite the COVID-19 vaccine effectively preventing severe disease resulting in hospitalizations and death, African-Americans continue to have low vaccine uptake. In Florida, 44% of African-Americans have received at least one dose of the COVID-19 vaccine compared to 62% non-Hispanic Whites (KFF, 2022).

Overall, the COVID-19 pandemic has amplified underlying causes of health inequities and barriers in health care, impacting people of color and underserved communities, such as social determinants of health (SDoH), the growing economic inequality, access to care and treatment, and health literacy. SDoH refers to factors, such as environment, income, education, access, and literacy, that contribute to inequity a risk to functional ability, and overall quality of life for individuals, groups, and communities (Office of Disease Prevention and Health Promotion (OASH), 2021; Palacio & Tamariz, 2021). Vaccine hesitancy continues to be a global health issue and has been identified as one of the WHO's top 10 threats to global health in 2019 (WHO, 2019). Vaccine hesitancy refers to patients' reluctance to accept or refuse vaccines/immunizations (MacDonald, 2015; Troiano & Nardi, 2021). Key characteristics related to vaccine acceptance include self-identification as a democrat, holding a college degree, being a male, being a healthcare worker, and having significant concerns about being infected by COVID-19. The highest hesitancy rates are among African-Americans/Blacks, those with a low income, being religious, young, and female (See Table 1) (McElfish et al., 2021; Troiano & Nardi, 2021).

Methodology

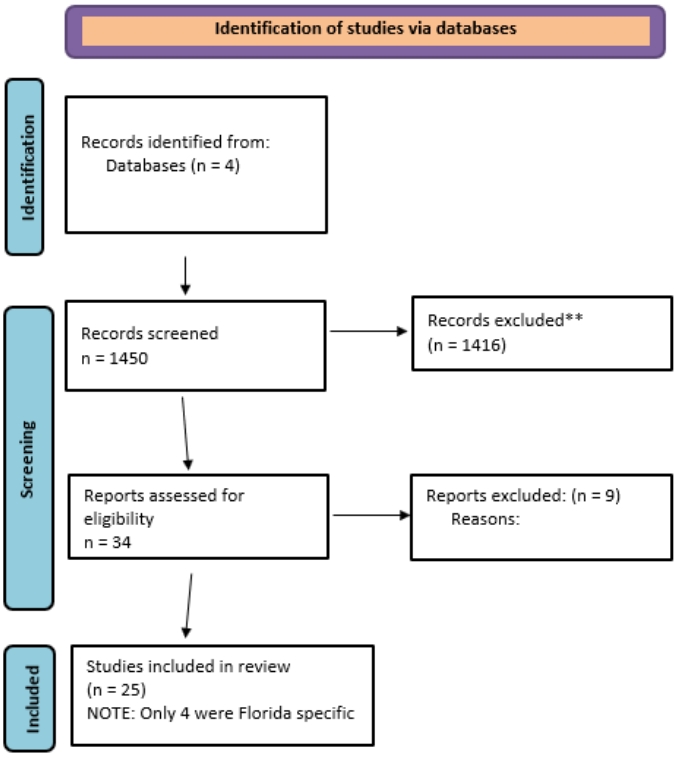
The purpose of this literature review is to and prepare for the best possible interventions that would over the concern of vaccine hesitancy. Funding for this endeaver was imminent and strategies were needed to provide the best possible outcomes. Thus, a literature review was necessary to guide evidence-based program creation and benefit to those participating in the intervention.

COVID-19 was a new infectious disease that led to the development of new vaccines to combat the virus. Reaching and influencing under-represented groups to encourage vaccine acceptance and overcoming hesitancy had been challenging, especially related to African-Americans in Florida. Due to the lethality of the COVID variants and the urgency of the matter, this group of researchers decided to conduct a literature review to identify literature that could be used to identify strategies to apply to efforts to disseminate information in a format that positively influences health beliefs and behaviors amongst under-represented groups. Newspapers and online magazines were initially searched, and the findings were cataloged.

Student trainees were hired to assist with the literature search. This review of the literature was structured and focused on scholarly articles from Medline Complete Database, CINAHL, Nursing@OVID, and Pubmed. Keywords used were (vaccine hesitancy and COVID-19) AND (Black or African-American or African-American or Black). Articles were limited to those published within the last ten years, peer-reviewed, in English, and on United States populations. The same inclusion and exclusion criteria were used with each database search (Refer to Table 2).

Results

In total, 34 scholarly articles were reviewed in the review process. Twenty-five articles were included in the literature review and used to inform interventions with residents of northern Florida (See Figure 1). Table 3 is a catalog of articles reviewed and selected in the scoping review on vaccine hesitancy in Blacks and/or African-Americans and other ethnic groups in the United States. Articles in Table 3 highlight key findings of each of the included articles.



Discussion

Studies reviewed confirmed that Blacks and African-Americans were the highest groups displaying vaccine hesitancy. Each study was reviewed to identify information on barriers to vaccine acceptance and potential strategies to overcome vaccine hesitancy.

Barriers

Vaccine hesitancy is patients' reluctance to accept or refuse vaccines/immunizations (MacDonald, 2015; Troiano & Nardi, 2021). Vaccine hesitancy is on a continuum from being slow to accept a vaccine to accepting only select vaccines to refusal of all vaccines. Reluctance is influenced by "convenience, complacency, and confidence" (MacDonald, 2015, p. 4162). MacDonald identified the following contributors to vaccine hesitancy:

> Media communication; the views of influential leaders; historical factors; political views; cultural values; geographical barriers; knowledge deficits; perceived risk and benefits; mode of administration; vaccine reliability; vaccine cost; fear of needles; fear of foreign substances entering their bodies; and mistrust for healthcare providers (2015).

Barriers identified in the MacDonald research were

confirmed in the literature review studies by Higginson et al. (2021), Gerretsen et al. (2021), Jones et al. (2021), Litaker et al. (2021), Moore and his team (2021), Okoro et al. (2021), Stern et al., (2021), Willis et al. (2021), Ergün et al. (2022), and Ignacio et al. (2022). Jones and the team (2021), Kreuter et al. (2022), and Sullivan et al. (2022) also identified that complacency and access to the COVID vaccine contributed to vaccine hesitancy. Kaiser Family Foundation (KFF) reported that the newest vaccine and a lack of information caused vaccine hesitancy and refusal (2022). Okoro and team's study highlighted the barriers of conspiracy theories, religious conflicts, and distrust of the government related to the COVID-19 vaccine (2021).

Dr. Kriss and her research team (2021) discovered complacency as a contributor to hesitancy amongst patients who received a single dose of the two-dose series of the COVID-19 vaccination. The team recommended education and close follow-up with reminders to overcome complacency-based hesitancy.

Vaccine hesitancy related to COVID-19 persists. Hesitancy rationales include the speed of the vaccine development, unknown length, degree of protection, and short vs. long-term safety of the vaccine (Troiano & Nardi, 2021; KKF, 2022). Troiano and Nardi found vital factors related to vaccine acceptance and hesitancy of the COVID-19 vaccines (2021). Factors contributing to COVID-19 vaccination hesitancy also include decreased access to healthcare, limited participation of Blacks in vaccine studies, fear of side effects, and the lack of trust in the Black communities for healthcare providers and systems (Gerretsen et al., 2021; Jones et al., 2021; Sharma, Batra, & Batra, 2021; Ergün et al., 2022; Nguyen et al., 2022; Padamsee et al., 2022). Studies on Black vaccine hesitancy align with the findings of earlier studies. Black participants had increased hesitancy if they were Republican, had lower incomes, were Christian or Atheist, were College-aged, and mistrusted the healthcare system (Sharma, Batra, & Batra, 2021; Bogart et al., 2021; Okoro et al., 2021; Ergün et al., 2022).

A study by Stern et al. conducted in three prisons and thirteen jails cited common reasons reported for COVID-19 vaccine hesitancy waiting for more information (54.8%) and efficacy or safety concerns (31%). The most common reason for COVID-19 vaccination refusal was distrust of healthcare, correctional, or government personnel or institutions (Stern et al., 2021). In 2022, Willis and his colleagues published data that found that. . . "hesitancy was not evenly distributed across sociodemographic groups (age, sex, race/ethnicity, and education) and was associated with whether a non-English language is spoken in the home, health care coverage, and flu vaccination over the past five years in a bivariate analysis" (Willis et al., 2021).

A study by Daly et al. in 2021 showed a longitudinal decline in reported vaccine hesitancy in late 2020 and early 2021. Reduced hesitancy occurred with the approval of COVID-19 vaccines and mass vaccination rollout programs. A significant decline in vaccine hesitancy was reported in all demographic groups, especially Black and Hispanic participants. Vaccine hesitancy declined significantly by 10.8 percentage points (95% CI, 8.9-12.7), from 46% in October 2020 to 35.2% in March 2021. Declines in hesitancy were most significant among Hispanic (15.8 percentage point decrease, from 52.3% to 36.5%) and Black participants (20.9 percentage point decrease, from 63.9% to 43%). Data also demonstrated that hesitancy was high among adults aged 18-39 years (44.1%), those without a degree (42.9%), and households earning $50,000 or less (43.7%) (Daly et al., 2021). This decrease in hesitancy is an essential step in the right direction since COVID-19 vaccine acceptance has been particularly low among these groups. Additionally, these groups have experienced a disproportionate burden of severe illness and death because of COVID-19 (Gold et al., 2020; Lopez et al., 2021; Robinson et al., 2021).

Awareness of barriers to vaccine acceptance led to a better understanding of strategies to reduce hesitancy. Strategies that can persuade Blacks and African-Americans to accept the COVID vaccine are developing and maintaining trust, gaining entry through key community healthcare gatekeepers, strategic application of peer pressure and the use of influencers, messages crafted to reflect the vernacular of the target population, honesty, a consistent local presence, acknowledge of SDOH, and creative messaging (Refer to Table 4) (Bogart et al., 2021; Privor-Dumm & King, 2020; Strully et al., 2021).

Strategies

The literature review revealed activities that could be used to minimize vaccine hesitancy in Florida. See Table 4. Strategies that can persuade Blacks and African-Americans to accept the COVID vaccine are:

1. *Trusted community members make the best educators* - Interventions, such as communication and education from trusted community members, such as churches, leaders, and known healthcare workers (Bateman et al., 2022; Budhwani et al., 2021; Willis et al., 2021; Ignacio et al., 2022; Ergün et al., 2022; Kreuter et al., 2022; Padamsee et al., 2022).
2. *Social pressure can influence behaviors* - They respond to social pressure. This pressure can come from religious institutions, community groups, and families (Budhwani et al., 2021).
3. *Use cultural vernacular, language, and values in messaging appropriately* - They are likelier to trust messages in their vernacular (Ignacio et al., 2022).
4. *Take the message directly to the people* - This group requires a demonstration of outreach beyond typical media. They are receptive to material from different sources, such as door-to-door campaigns, one-on-one discussions, and pamphlets, especially when online access is unavailable (Attonito et al., 2021; Ergün et al., 2022).
5. *Acknowledge past wrongs* - In the study by Bogart and team, Black participants reported that it was important for educators to acknowledge past wrongs by healthcare workers, systems, and researchers to build trust (Higginson et al., 2021; Ignacio et al., 2022; Padamsee et al., 2022).
6. *Focus education on Frequently Asked Questions* - Education should answer the known factors related to hesitancies, such as cost, efficacy, safety, and combat misinformation (Daly, Jones, & Robinson, 2021; Higginson et al., 2021; Ergün et al., 2022).
7. *Utilize healthcare personnel who are representative of the target population* - Having community members better receive Black/African-American or other minority healthcare workers providing services (Budhwani et al., 2021; Ergün et al., 2022; Padamsee et al., 2022).
8. Media materials and influencers can serve as trusted information sources- Television, radio, online, and social media users may be motivated to follow the views and behaviors of celebrities and influencers (Jones et al., 2021; Ignacio et al., 2022).
9. Consistent, repeated messaging over time is required - One-time messaging could be more helpful. Instead, ongoing, consistent messaging is preferred (Daly, Jones, & Robinson, 2021; Sullivan et al., 2022; Padamsee et al., 2022).

Limitations

Our review was limited to four databases, and the search was primarily completed in the early years of the COVID pandemic. A systemic review would deepen investigation into this topic.

Implications

Implications for practice include primary prevention strategies for minority and underserved populations that are not to be one-size-fits-all but, instead, designed to align with the preferences of the target population. In addition, even previously successful interventions may require adaptation to meet new situations, as people's receptivity depends on numerous factors, such as relationships, perceived risk level, current knowledge, and the availability of resources. Vaccine hesitancy, for Blacks and African Americans, is even further complicated by the history of mistreatment, structural racism, and health inequity that has been commonplace for centuries. In planning new interventions and education for Black and African-American populations, the root causes of hesitancy and refusal must be taken into consideration.

Future Plans and Recommendations

This literature review stemmed from a desire to prepare for intervening to assist underserved populations in northern Florida to protect themselves during the COVID-19 exigency. The information gathered was intended to be used in the planning and implementing of a program to encourage COVID-19 vaccination in the rural Northern Florida area. An

interdisciplinary team at Florida A&M University will utilize the evidence-based interventions uncovered in this literature review to develop and implement community-based interventions to promote the acceptance of the COVID-19 vaccine. Evidence-based interventions are the hallmark of sound nursing and healthcare practice. Part 2 of article focuses on interventions developed and implemented based on findings in this literature review. Based on barriers and strategies uncovered in this literature review, future research could compare vaccine acceptance and hesitation that compares viewpoints early in the pandemic to current views. Additional research is also needed regarding vaccine hesitancy in persons before and after contracting the COVID-19 virus.

Conclusion

COVID-19 vaccine hesitancy among Black and African-Americans is a barrier to the health and well-being of this group of people. Barriers to vaccine acceptance are complex. These barriers stem from history and personal experiences, resulting in deep-seated fear and mistrust of government authorities and healthcare professionals. The past has a direct impact on overcoming barriers and planning future interventions. Overcoming these vaccine hesitancy barriers requires healthcare professionals to take time to learn and understand the group's perspectives, identify evidence-based strategies that have been effective in the past, and willingness to adapt inventions, as needed, for new situations.

Table 1

Comparison of high acceptance and hesitancy rates

High Acceptance Rates	High Hesitancy Rates
Democrats	African-American
Higher education	Low income
Men	Religious
Serious concern about being infected	Women
Healthcare Workers	Younger people/College-age People

Note: No difference was found between people who had been previously infected with COVID and those that were not.

Table 2.

Databases, Search Terms, and Inclusion Criteria

Databases	Terms	Inclusion Criteria
CINAHL MEDLINE PubMed Nursing@OVID	Vaccine hesitancy and COVID-19) AND (Black or African-American, African-American, or Black)	1. One database was searched at a time. 2. The key terms were entered and searched. The search record was documented to allow research supervisors to duplicate the search. 3. The articles produced from the search criteria were selected and reviewed based on article titles and topic relevance. 4. Abstracts were read to determine relevance further. All articles with relevant titles and abstracts were extracted and stored for a full review. 5. The full-text articles were that read and summarized, noting the research location, participant demographics, sample size, type of research, findings related to populations strengths and barriers to vaccine acceptance, and strategies for oncoming vaccine hesitancy. 6. A team reviewed each article on three interdisciplinary researchers. A majority vote resolved discrepancies in inclusion decisions after discussion. 7. Excluded articles are separated but cataloged with notes on the rationale for their exclusion. (Levac et al., 2010).

Table 3

Articles Included in the Review of Literature

Name of Journal Article	Source of database	Reach of the literature (national, state, local); Sample Size	Summary of information; Study Purpose; Study Design;	Specific community or population impacted within the literature	Limitations
Included Articles (25)					
Attonito, J., Van Arsdale, W., Fishman, K., Darya, M., Jacomino, M., & Luck, G. (2021). Sociodemographic Disparities in Access To COVID-19 Vaccines Upon Initial Rollout In Florida. *Health affairs (Project Hope)*, *40*(12), 1883–1891. https://doi.org/10.1377/hlthaff.2021.01055	PubMed/ Health Affairs	State Sample N=650	The study aimed to explore racial, ethnic, geographic, and socioeconomic disparities in the distribution and early access to the COVID-19 vaccine in Florida. Study Design: Descriptive COVID-19 vaccine access was investigated in the vaccine rollout at Publix grocery store locations throughout Florida. Findings: Vaccines were available in Whiter areas. Recommendation - vaccine distribution should be monitored through a socioeconomic lens to help prevent unequal access.	Floridian population, those within Florida ZIP codes who received vaccination at Publix stores	Overall, the study did not investigate other barriers to access, such as transportation and internet availability. The data collected for demographics was also based on the Census Bureau from 2019, which is self-reported and may have changed. Lastly, the analysis examined the vaccine rollout in retail pharmacies during January 2021 and did not monitor or access changes over time.
Bateman, L. B., Hall, A. G., Anderson, W. A., Cherrington, A. L., Helova, A., Judd, S., Kimberly, R., Oates, G. R., Osborne, T., Ott, C., Ryan, M., Strong, C., & Fouad, M. N. (2022). Exploring COVID-19 Vaccine Hesitancy Among Stakeholders in African-American and Latinx Communities in the Deep South Through the Lens of the Health Belief Model. *American journal of health promotion: AJHP*, *36*(2), 288–295. https://doi.org/10.1177/08901171211045038	PubMed	State (Alabama) N=67	This study explores perceptions of COVID-19 vaccination intention among African-American and Latinx participants and suggests interventions. Study Design: Qualitative Study Qualitative study on perceptions of the COVID-19 vaccination intention among African-American and Latinx participants. The study focused on intervention strategies to decrease hesitancy. It also identified themes driving COVID-19 vaccine hesitancy, such as mistrust, fear, and lack of information. Recommended strategies should be multi-modal, community-engaged, and provide consistent, comprehensive messages from trusted sources.	A virtual, qualitative survey of primarily Latinx and African-Americans that are residents/ stakeholders in Jefferson, Mobile, and Dallas counties	The population mainly represented community leaders' perspectives who spoke on their community's behalf, which perspectives may have differed if not a community leader. A study was conducted prior to vaccines being approved for emergency use which may have changed hesitancy toward more acceptance of the vaccine.

Budhwani, H., Maycock, T., Murrell, W., & Simpson, T. (2021). COVID-19 Vaccine Sentiments Among African-American or Black Adolescents in Rural Alabama. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, *69*(6), 1041–1043. https://doi.org/10.1016/j.jadohealth.2021.09.010	MEDLINE; CINAHL	State Sample N=28	Ascertain sentiments toward COVID-19 vaccination among rural African-Americans and Black adolescents in Alabama. Study Design: Qualitative Study Alabama; rural; 15 -17 years old Three (3) themes emerged: influence of community leaders and older family members, fear of side effects and misinformation, and institutional distrust—socioecological approach to messaging.	Black communities	The information was based on teenagers' self-reporting.
Carroll, J. K., Arias Hernandez, P., Brooks-Greisen, A., Carlos Cardet, J., Cui, J., Ericson, B., Fagan, M., Fajt, M. L., Forth, V. E., Fuhlbrigge, A. L., Lorenzi, M., Rodriguez-Louis, J., Maher, N. E., Manning, B. K., Pace, W. D., Shields, J. B., & Israel, E. (2022). Socioeconomic impact of COVID-19 and willingness to be vaccinated in African-American/Black and Hispanic/Latinx adults. *Journal of the National Medical Association*, *114*(2), 182–192. https://doi.org/10.1016/j.jnma.2021.12.010	MEDLINE	State Sample N=325	The study describes the socioeconomic and healthcare-related effects of the COVID-19 pandemic, and the willingness to receive a free COVID-19 vaccine, among African-American/Black and Hispanic/Latinx adults with asthma. Study Design: Cross-sectional survey Sub-study of a Randomized, open-label, pragmatic, real-world study prepared AA/Blacks and Latinx persons with asthma and hesitancy	AA/Black, Hispanic/Latinx w/asthma;	The study is a cross-sectional survey conducted during a rapidly changing situation. Respondents represent a convenience sample for this sub-study rather than a random sample of participants. Additionally, needs qualitative data for this sub-study to provide a deeper understanding of the rationale of participant responses.
Choi, K., Rondinelli, J., Cuenca, E., Lewin, B., Chang, J., Luo, Y. X., Bronstein, D., & Bruxvoort, K. (2022). Race/Ethnicity Differences in COVID-19 Vaccine Uptake Among Nurses. *Journal of transcultural nursing: official journal of the Transcultural Nursing Society*, *33*(2), 134–140. https://doi.org/10.1177/10436596211065395	Pub/Med ; Sage Journals	Local (Southern California) Sample N=1183	The study investigated associations between race/ethnicity and COVID-19 vaccine uptake among Nurses. Study Design: Observational Survey Study Nurses in Southern California. Sample - 1183 participants; Survey completed on perceptions and use of the COVID-19 vaccine. People of color have been identified as groups with low levels of COVID-19 vaccine acceptance.	Registered Nurses and Licensed Vocational Nurses at Kaiser Permanente Southern California between March and April 2021	Cross-sectional, self-reported and voluntary response survey. The survey may be subject to selection bias, to those who received the vaccine were more likely to respond. Limited representation of racial/ethnic groups of Native American/Alaskan groups and did not capture multiracial identities and heterogeneity within all racial/ethnic groups.

Cyrus, E., Clarke, R., Hadley, D., Bursac, Z., Trepka, M. J., Dévieux, J. G., Bagci, U., Furr-Holden, D., Coudray, M., Mariano, Y., Kiplagat, S., Noel, I., Ravelo, G. J., Paley, M., & Wagner, E. (2020). The impact of COVID-19 on African-American communities in the United States. *medRxiv: the preprint server for health sciences*, 2020.05.15.20096552. https://doi.org/10.1101/2020.05.15.20096552	PubMed	National Counties Sample N=152	The study aimed to understand the relationship between African-American density and other social determinants with national COVID-19 prevalence and death rates. Study Design: Ecological analysis utilizing multivariable linear regression. The impact of the high density of African-American communities on coronavirus disease 2019 (COVID-19) prevalence and death rate within the three most populated counties in each US state and territory demonstrated that these communities were disproportionately burdened with COVID-19.	African-Americans	Non-Hispanic Whites were not included in the analysis as a reference group. It did not test differences between the counties, and prevalence may be skewed depending on the availability of the test per county population.
Daly, M., Jones, A., & Robinson, E. (2021). Public Trust and Willingness to Vaccinate Against COVID-19 in the US From October 14, 2020, to March 29, 2021. *JAMA,* 325(23):2397–2399. doi:10.1001/jama.2021.8246	PubMed/ JAMA	National Sample N=7,024	The study tests changes in trust in vaccination and vaccine hesitancy. Study Design: Quantitative Research Survey There is high public distrust of the COVID-19 vaccine. The study demonstrated that vaccine hesitancy declined over time and was observed across demographic groups. Public trust increased significantly across all groups.	A nationwide e-survey of people around the United States, which included White, Black, Hispanic, and other racial/ethnic groups (Asian, American Indian/Alaska Native, and Native Hawaiian or other Pacific Islander)	Low UAS panel recruitment rate, reliance on self-reported measures, and participation by community-dwelling adults comfortable completing web-based surveys were in English or Spanish.
Ergün, A., Bekar, A., Aras, B., Dere, C., Tekneci, D., Sarıçiçek, G., Akdere, S. N., Telli, S., Pehlivanlı, Ş. B., Özyurek Ucael, D., Özden, M. E., Altıntaş, E., & Aslan, D. (2022). Determination of Novel Coronavirus Disease (COVID-19) Vaccine Hesitancy Using a Systematic Review Approach Based on the Scientific Articles in PubMed Database. Turkish thoracic journal, 23(1), 70–84. https://doi.org/10.5152/ TurkThoracJ.2022 .21082	PubMed	National Sample N=80	Purpose: Investigate and analyze how hesitancy related to the COVID-19 vaccine is reflected in the literature. Study Design: Systematic Review The review identified various articles, including descriptive, cross-sectional, intervention, systematic review, and non-research article categories.	African-Americans Caucasians Asians Hispanics	Limitations: Only PubMed was used, and the study reflects only a cross-section of the COVID-19 period.

Gerretsen, P., Kim, J., Caravaggio, F., Quilty, L., Sanches, M., Wells, S., Brown, E. E., Agic, B., Pollock, B. G., & Graff-Guerrero, A. (2021). Individual determinants of COVID-19 vaccine hesitancy. *PloS one*, *16*(11), e0258462. https://doi.org/10.1371/journal.pone.0258462	PubMed	National Sample N=7,678	The study identifies the determinants of COVID-19 vaccine hesitancy in the US and Canada. Study Design: Web-based Survey Novel coronavirus disease 2019 (COVID-19) vaccine hesitancy is a barrier to achieving herd immunity, and thus, a prominent public health concern.	African-Americans Caucasians Asians Hispanics	Web-based survey and may not have reached participants without access to a computer. Cross-sectional data and only completed surveys were included. Data collected was prior to vaccine availability for COVID-19.
Higginson, J. D., Tumin, D., Kuehhas, T. C., DeLozier-Hooks, S. E., Powell, C. A., Ramirez, D. D., Dabelić, A., & Basso, M. R. (2021). COVID-19 Vaccine Hesitancy Among Deployed Personnel in a Joint Environment. *Military Medicine*. https://doi.org/10.1093/milmed/usab518	MEDLINE	National Sample 1809	-This study aimed to investigate vaccine hesitancy among military personnel nationally. Findings – Black military personnel was most likely to report vaccine hesitancy. Design – Retrospective review of electronic record	Military Persons	*Single collection site. *Unable to generalize findings *Focused on a set timeframe. Records after the set timeframe may have revealed contradictory information.
Ignacio, M., Oesterle, S., Mercado, M., Carver, A., Lopez, G., Wolfersteig, W., Ayers, S., Ki, S., Hamm, K., Parthasarathy, S., Berryhill, A., Evans, L., Sabo, S., & Doubeni, C. (2022). Narratives from African-American/Black, American Indian/Alaska Native, and Hispanic/Latinx community members in Arizona to enhance COVID-19 vaccine and vaccination uptake. *Journal of Behavioral Medicine*. https://doi.org/10.1007/s10865-022-00300-x	MEDLINE	States Sample N=137	Purpose: To identify multi-level factors associated with COVID-19 vaccine uptake Study Design: Qualitative focus groups and survey Arizona; AA/Black, American Indian, Alaska Native, Latinx vaccine acceptance behaviors	AA/Black, American Indian, Alaska Native, Latinx	Focus groups were conducted over a seven-month period in which data may not be comparable to early focus groups. Participants lived in urban areas of Arizona and did not include rural areas. Online survey samples cannot be interpreted as representing participants in a focus group, as participants could choose to participate in an online survey, focus group, or both.
Jones, D. L., Salazar, A. S., Rodriguez, V. J., Balise, R. R., Starita, C. U., Morgan, K., Raccamarich, P. D., Montgomerie, E., Nogueira, N. F., Barreto Ojeda, I., Maddalon, M., Rodriguez, N., Brophy, T., Martinez, T., & Alcaide, M. L. (2021). Severe Acute Respiratory Syndrome	PubMed	Local (Miami, Fl) Sample N=94	The aim was to examine factors underlying COVID-19 vaccine hesitancy among people with HIV. Study Design: Cross-sectional study Participants surveyed on (COVID-19) vaccine hesitancy.	Adults (≥18 years of age) with HIV living in Miami, Fl. Mean age 54.4 years, 52% were female, 60% were Black non-Latinx, and	Convenience sample, small sample size, limited timeframe for data collection prior to vaccine availability, and limited racial/ethnic representation.

Coronavirus 2: Vaccine Hesitancy Among Underrepresented Racial and Ethnic Groups With HIV in Miami, Florida. *Open forum infectious diseases*, *8*(6), ofab154. https://doi.org/10.1093/ofid/ofab154			Findings: Black non-Latinx participants were less likely to agree that vaccinations are important for health when compared to non-Black Latinx participants.	40% were non-Black Latinx.	
Kreuter, M. W., Garg, R., Marsh, A., Thompson, T., Caburnay, C., Teshome, E., Kulkarni, S., Tanpattana, T., Wolff, J., & McQueen, A. (2022). Intention to vaccinate children for COVID-19: A segmentation analysis among Medicaid parents in Florida. *Preventive medicine*, *p. 156*, 106959. https://doi.org/10.1016/j.ypmed.2022.106959	PubMed	State (Florida) Sample N=1,951	The study aimed to provide actionable insights to increase confidence about COVID-19 vaccination among parents of young children on Medicaid. Study Design: Mixed method study (quantitative and qualitative) Study on the likelihood of parents who would be willing to give their children the COVID vaccine.Study recommendations made for outreach and education efforts to increase willingness to vaccinate children.	Parents with children five years old or younger who receive healthcare through Florida Medicaid	Data was collected early in 2021, and vaccine confidence may have increased. Findings are not generalizable due to the sample belonging to one Medicaid health plan and being disproportionately female and younger compared to adult patients.
Kriss, J. L., Reynolds, L. E., Wang, A., Stokley, S., Cole, M. M., Harris, L. Q., Shaw, L. K., Black, C. L., Singleton, J. A., Fitter, D. L., Rose, D. A., Ritchey, M. D., Toblin, R. L., & CDC COVID-19 Vaccine Task Force (2021). COVID-19 Vaccine Second-Dose Completion and Interval Between First and Second Doses Among Vaccinated Persons - United States, December 14, 2020-February 14, 2021. *MMWR. Morbidity and mortality weekly report*, *70*(11), 389–395. https://doi.org/10.15585/mmwr.mm7011e2	PubMed/ CDC	National N= 37,335,139	The study aimed to assess COVID-19 vaccine administration completion and examine the interval between the first and second doses. Study Design: Analysis of the MMWR report The study investigated people's willingness to get the second COVID-vaccine shot.	African-Americans Caucasians Asians Hispanics	Second-dose status is unknown for 7.9% of first-dose recipients, persons may have been counted twice, and racial/ethnic group data is missing for 45.9% of persons with sufficient time to receive a second dose.
Litaker, J. R., Tamez, N., Lopez Bray, C., Durkalski, W., & Taylor, R. (2021). Sociodemographic Factors Associated with Vaccine Hesitancy in Central Texas Immediately Prior to COVID-19 Vaccine Availability. *International Journal of Environmental Research and Public Health*, *19*(1). https://doi.org/10.3390/ijerph19010368	MEDLINE	State Sample N=1,648	The study aimed to identify sociodemographic factors associated with vaccine hesitancy. Study Design: Online survey Herd immunity; Central Texas; 2020	General Populations	A cross-sectional survey represents those insured and self-reported information.

McElfish, P. A., Willis, D. E., Shah, S. K., Bryant-Moore, K., Rojo, M. O., & Selig, J. P. (2021). Sociodemographic Determinants of COVID-19 Vaccine Hesitancy, Fear of Infection, and Protection Self-Efficacy. *Journal of Primary Care & Community Health*, *12*, 21501327211040744. https://doi.org/10.1177/21501327211040746	MEDLINE; CINAHL	State Sample N=754	The study examines associations between sociodemographic factors and COVID-19 vaccine hesitancy, fear of infection, and protection self-efficacy. Study Design: Online survey Arkansas; online survey; causes for hesitancy	General Population	Cross-sectional did not assess trends in COVID-19 vaccine hesitancy over time. Results only represent participants at six clinics and not those without a primary care provider or e-mail addresses.
Moore, J. X., Gilbert, K. L., Lively, K. L., Laurent, C., Chawla, R., Li, C., Johnson, R., Petcu, R., Mehra, M., Spooner, A., Kolhe, R., & Ledford, C. (2021). Correlates of COVID-19 Vaccine Hesitancy among a Community Sample of African-Americans Living in the Southern United States. *Vaccines*, *9*(8), 879. https://doi.org/10.3390/vaccines9080879	PubMed	National (Southern States) Sample N=257	African-Americans (AAs) are more likely to be hesitant in receiving COVID-19 vaccinations. The study highlighted factors associated with vaccine hesitancy among AA communities. Location - Central Savannah River Area. Design - cross-sectional analysis of survey data	African-Americans	Participants self-report; therefore, misclassification was possible. The participants needed to be made aware of the focus of the study. This may have impacted their responses. Researchers did not distinguish between responses from participants who had COVI previously and those that did not.
Nguyen, L. H., Joshi, A. D., Drew, D. A., Merino, J., Ma, W., Lo, C. H., Kwon, S., Wang, K., Graham, M. S., Polidori, L., Menni, C., Sudre, C. H., Anyane-Yeboa, A., Astley, C. M., Warner, E. T., Hu, C. Y., Selvachandran, S., Davies, R., Nash, D., Franks, P. W., … COPE Consortium (2022). Self-reported COVID-19 vaccine hesitancy and uptake among participants from different racial and ethnic groups in the United States and the United Kingdom. *Nature communications*, *13*(1), 636. https://doi.org/10.1038/s41467-022-28200-3	PubMed	National (US and UK) US Sample – N = 87,388	Minorities have had the highest rates of COVID-19 infections. A study in the US and UK focused on vaccine hesitancy and acceptance. Acceptance rates are lowest in Blacks in both countries. The causes were related to hesitancy and access disparities. Design – The researchers used a smartphone collection tool then they conducted a comparative population-based cohort study focused on disparities between racial and ethnic populations regarding willingness to accept the COVID vaccine.	African-Americans Caucasians Hispanic / Latino	*Self-reported information *Most of the participants were not from ethnic and racial minorities.
Okoro, O., Kennedy, J., Simmons, G., Jr, Vosen, E. C., A., K., Singer, D., Scott, D., & Roberts, R. (2021). Exploring the Scope and Dimensions of Vaccine Hesitancy and Resistance to Enhance COVID-19 Vaccination in Black Communities. *Journal of Racial and Ethnic Health Disparities*. https://doi.org/10.1007/s40615-02101150-0	MEDLINE	Local Sample: N=183	Black Community; reasons for vaccine hesitancy; Design – Mixed method study; web-based survey using a cross-section of a convenience sample and individual semi-structured interviews.	Black Community	*The study was conducted before the existence of a COVID vaccine. *No response rate information could be gathered. *This was a purposive sample; therefore the findings cannot be generalized.

Olanipekun, T., Abe, T., Effoe, V., Kagbo-Kue, S., Chineke, I., Ivonye, C., & Bakinde, N. (2021). Attitudes and Perceptions Towards Coronavirus Disease 2019 (COVID-19) Vaccine Acceptance Among Recovered African-American Patients. *Journal of general internal medicine*, *36*(7), 2186–2188. https://doi.org/10.1007/s11606-021-06787-5	PubMed/ Society of General Internal Medicine 2021	State; Sample N=119	Compared to other racial groups, Blacks/African-Americans are disproportionately affected by COVID-19. Blacks/AAs had the lowest vaccine acceptance rates. Hesitance was due to concerns regarding side effects and distrust of healthcare systems. This study aimed to examine the vaccine acceptance in Black patients who had contracted COVID-19 post-hospitalization. Design – Cross-sectional sample and survey.	Patients of Grady Memorial Hospital in ATL, GA; African-American patients hospitalized with COVID-19.	*Small sample from a single site; therefore, not generalizable. *Study conducted early in the pandemic.
Padamsee, T. J., Bond, R. M., Dixon, G. N., Hovick, S. R., Na, K., Nisbet, E. C., Wegener, D. T., & Garrett, R. K. (2022). Changes in COVID-19 Vaccine Hesitancy Among Black and White Individuals in the US. *JAMA network open*, *5*(1), e2144470. https://doi.org/10.1001/jamanetworkopen.2021.44470	PubMed/ JAMA	National Sample N=1200	COVID-19 has disproportionately affected Black individuals in the US; however, vaccination rates among Black individuals trail those among other racial groups. This disparity is often attributed to a high level of vaccine hesitancy among Black individuals, but few studies have examined changes in vaccine hesitancy over time. Purpose: To examine differences between Whites and Blacks in vaccine hesitancy views. Design: A nonprobability internet panel was surveyed (Quantitative)	African-Americans Caucasians	*Self-reported *Sample mainly was of well-educated participants
Palacio, A., & Tamariz, L. (2021). Social Determinants of Health Mediate COVID-19 Disparities in South Florida. *Journal of general internal medicine*, *36*(2), 472–477. https://doi.org/10.1007/s11606-020-06341-9	PubMed	South Florida Sample N= 97,594	Reports of health disparities related to COVID-19. Understanding social determinants of health to help in developing strategies to prevent further COVID-19 spread. Design: A cross-sectional ecological study	African-Americans Hispanics	*Narrow area/location of focus *Race was self-reported could have resulted in misclassification.

Stern, M. F., Piasecki, A. M., Strick, L. B., Rajeshwar, P., Tyagi, E., Dolovich, S., Patel, P. R., Fukunaga, R., & Furukawa, N. W. (2021). Willingness to Receive a COVID-19 Vaccination Among Incarcerated or Detained Persons in Correctional and Detention Facilities - Four States, September-December 2020. *MMWR. Morbidity and Mortality Weekly Report*, *70*(13), 473–477. https://doi.org/10.15585/mmwr.mm7013a3	MEDLINE; CINAHL; PubMed	Four States Sample N=5110	Incarcerated and detained persons and vaccine hesitancy; AA and Blacks had high acceptance rates; Four States Design: Survey	General population imprisoned	*Specific prison facilities were used. Findings cannot be generalized across the US. *Study conducted prior to the availability of the COVID vaccine.
Sullivan, M. C., Mistler, C., Copenhaver, M. M., Wickersham, J. A., Ni, Z., Kim, R. S., & Shrestha, R. (2022). Race, trust, and COVID-19 vaccine hesitancy in people with opioid use disorder. *Health Psychology : Official Journal of the Division of Health Psychology, American Psychological Association*, *41*(2), 115–120. https://doi.org/10.1037/hea0001120	MEDLINE; CINAHL	Local Sample N = 109	Opioids users' willingness to accept a COVID vaccine; phone surveys; Findings AA/Blacks have high hesitancy	General populations	*Limited recruitment ability *Small sample size
Willis, D. E., Andersen, J. A., Bryant-Moore, K., Selig, J. P., Long, C. R., Felix, H. C., Curran, G. M., & McElfish, P. A. (2021). COVID-19 vaccine hesitancy: Race/ethnicity, trust, and fear. *Clinical and Translational Science*, *14*(6), 2200–2207. DOI: 10.1111/cts.13077	MEDLINE; PubMed	State Sample N=1205	This study aimed to examine the likelihood of vaccine acceptance among residents of Arkansas; Blacks in Arkansas had the highest hesitancy. Design: Online voluntary survey of residents who were part of the state research registry	General Population	*Cross-sectional study with no ability to examine trends across time. *The registry was preliminary made up of females and well-educated persons. This population did not represent the population in the state.

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Mentoring Black, Indigenous and People of Color (BIPOC) Nursing Faculty toward Leadership Excellence: A Concept Analysis with Historical Research

Abstract

Background. Black, Indigenous, and People of Color (BIPOC)have unique needs as they adjust to roles as academicians and scientists. Although the importance of mentoring is emphasized across healthcare professions and among diverse disciplines and situations, the success of nursing faculty who are BIPOC, termed as Black, Indigenous, and Nursing Faculty of Color (BINFOC), is heavily influenced by the mentoring received early in their academic career. **Purpose.** Aims of the analysis are to present a model case using a novel strategy of integrating historical research, present attributes that have been influential in legacy building for more than 30 years, and elucidate the unique situation of mentoring BINFOC toward leadership excellence. **Methods.** We examine numerous documents, map major concepts, and organize the manuscript using Walker and Avant's eight-step approach to concept analysis. **Results.** Attributes noted during the analysis included evidence of mentoring BINFOC through 1) research, 2) interpersonal, 3) psychosocial and career, 4) culturally responsive/diversity, and 5) sponsorship. Hypothetical borderline and contrary cases are presented here. An actual model case, Dr. Sallie Tucker-Allen, was highlighted using historical research strategies. **Conclusion and Implications.** This analysis can help develop empirical and culturally specific intervention studies to assess the degree of effectiveness of mentoring BINFOC. Finally, this analysis illuminates attributes that influence quality mentoring of BINFOC toward leadership excellence.

Keywords: mentoring, nursing faculty, Black, Indigenous, Concept Analysis, historical research, Sallie Tucker-Allen

Introduction

Nursing faculty of color (NFOC), most significantly Blacks, have unique needs as they adjust to roles as academicians and scientists. Although the importance of mentoring is emphasized across healthcare professions and among diverse disciplines and situations, the success of nursing faculty who are BIPOC, termed as Black, Indigenous, and nursing faculty of color(BINFOC), is heavily influenced by the mentoring received. Black, Indigenous, and People of Color (BIPOC) emphasizes that systemic racial injustices severely impact Black and Indigenous people.

The current full-time and part-time nursing faculty workforce is dominated by members between the ages of 46 and 60 years of which 80.8% identify as Non-Hispanic Whites (NLN, 2019). Research has shown that the lack of diversity in nurse faculty affects the enrollment of minority students (Loftin et al., 2012; Salvucci & Lawless, 2016). The lack of representation also affects the motivation of Black nurses to seek leadership

and faculty positions (Iheduru-Anderson, 2020). This deficit has an inverse relationship with the number of diverse faculty members and clinicians providing care to diverse populations.

Weidman (2012) evaluated the value of mentors to ease the transition of the clinician to academia. The mentors successfully support the psychological health and well-being of the novice nurse faculty (Weidman, 2012). In addition, positive mentorship may improve the nurse faculty's perception of self-efficacy (SE). As a novice, new hire, or seasoned nurse faculty member, the presence of a welcoming and supportive environment can support thriving endeavors and cohesiveness. Increasing doctoral-prepared nurses and developing structured mentor programs for nurse faculty transitioning to academia may improve retention and increase faculty members' confidence during this transition and beyond.

One of the contributing factors to student decline is the shortage of nursing faculty (AACN, 2020). In 2019 the AACN began to survey 892 nursing schools with baccalaureate or graduate programs (Li et al., 2019). The data from this survey showed that the vacancy rate for nurse faculty is 7.2%, and 89.7% of those vacancies preferred doctoral-prepared faculty. The findings of the AACN emphasize not only the need for faculty but also the need for nurses to obtain a terminal doctoral degree. As the nursing profession continues to evolve, it is crucial for faculty to not only be recruited but also retained. The variability in workload, satisfaction, institutional support, and desire to stay within a current institution determines our ability to grow the nursing profession with qualified educators.

Purpose

Given the uniqueness required for applying mentorship to some segments of the population, void of bias and culturally relevant, the purpose of this concept analysis is to define and operationalize mentoring BINFOC, specifically Blacks, using Walker and Avant's (2019) eight-step approach while highlighting a model case using a novel strategy of integrating historical research in which presents attributes that have been influential in legacy building for more than 30 years and that elucidate the unique situation of mentoring BINFOC toward leadership excellence (Horgan & Simeon, 1990; Zanchetta et al.,2017).

Method

According to Walker and Avant (2019), concept analysis aids in clarifying the meaning, which helps define concepts for use in research, theory development, or practice. Using Walker and Avant's (2019) concept analysis, mentoring is analyzed across medicine, social science, education, and nursing. To facilitate a focused search of research literature published between 2011 to 2022 relevant to our concept of interest, a research librarian searched multiple databases (CINAHL Complete, MEDLINE, Academic Search Premier, Gale Academic OneFile, Education Source, Complementary Index, Gale OneFile: Health and Medicine, Supplemental Index, ScienceDirect, ERIC, and Nursing & Allied Health Collection: Comprehensive) using the terms Mentoring Nursing Faculty for Administration or dean or director or chair or Tenure and Research African OR American, OR Black, OR Of Color. For this analysis, *mentoring Black and Indigenous nursing faculty of color* will be discussed according to the following constructs: defining attributes; model, borderline, and contrary cases; antecedents and consequences; and empirical referents.

The Phenomenon of Interest

Mentoring, as an interactive process, provides reciprocal benefits to both mentor and mentee (Jones, 2017; Mariani, 2012; Rylance et al., 2017; Zanchetta et al., 2017). Mentoring is extensively used across disciplines with many definitions, attributes, and outcomes.

Mentoring is a phenomenon shown to facilitate learning and improve nurse confidence and role proficiency (Mijares et al., 2013). Additionally, mentoring is essential in developing the next generation of nurses and supporting experienced nurses throughout their careers during role transitions. Still, it lacks a cohesive, integrated conceptual model that can be broadly applied to nursing (Raines, 2018).

We define the BIPOC nursing faculty as those employed in higher learning institutions who self-identify as non-white. Faculty of Color is not synonymous with Black faculty; the terms are not used interchangeably in this paper. We choose the term Black, Indigenous, and Nursing Faculty of Color (BINFOC)

because of the current social climate in which non-whites collectively are increasingly experiencing racism and bias. Additionally, organizations focused on the needs of Blacks have also readily embraced and championed the varied needs of those of color.

Philosophical Underpinnings and Theory

Theories, models, frameworks, and concepts of mentoring are collaboratively used to drive progress and professional growth among educators. The discussion of mentoring relies on the theoretical underpinnings of both learning and mentoring theories. Theoretically, this relationship consists of, at minimum, a dyad of a competent and resourceful mentor and a protégé or mentee that is less competent or inexperienced, with the intention of advancing the knowledge and expertise of the latter. There are a few theories that philosophically express the mentoring elements and concepts of mentoring. The Mentor's Guide (Zachary & Fain, 2022) illuminates the process by which the Learner-Centered Mentoring Paradigm examines mentoring features such as mentee and mentor roles, the learning process, the length of the relationship, the setting, and the outcomes. There is notably a changing paradigm from passive to active learning; from authoritarian to facilitative roles; goal-determined and self-driven responsibilities, and from a product to a process-oriented focus. According to Zachary's Mentoring Model (2022), the cycle of this process passes through four phases: ***preparing, negotiating, enabling, and closing.*** During these four phases, specific activities express the relationship of this dyad (Zachary & Fain, 2022).

As race and ethnicity are examined relevant to the advancement of BINFOC in academia, the Social Cognitive Career Theory (SCCT; Lent et al., 2000) has been used to examine professional advancement critically. In SCCT, it is posited that a person's cognitive variables, such as self-efficacy and expected outcomes, were among the main factors influencing professional advancement (Lent et al., 2000). More recent versions of the SCCT theory added contextual influences, similar to the Learner-Centered mentoring paradigm, in which environmental factors are equally influential to career advancement and even has a reciprocal relationship with the person's cognitive variables (Lent et al., 2000).

Biggs's Presage-Process-Product Model describes a dynamic process in which the environmental context of this triad: learning, learner, and teacher, is integrated for the successful transformation of the mentee. Commonly referred to as the 3Ps model, it describes 3 points at which learning-related factors are placed (Biggs et al., 1996). Like Zachary's model, there is the presage or preparation period, the active learning which aligns with Zachary's phases of negotiating and enabling, and the last phase, the product or outcome (Biggs et al.,1996). Within the past two decades, as the paradigm of mentoring shifts, the ***Grow, Reality, Option, and Will*** or ***(GROW) model*** (Whitmore, 1992) has become more integrated as one of the more powerful frameworks for structuring elements of mentoring for professional success. ***GROW*** pushes the mentee along an inspirational and challenging performance journey rather than just settling for ***specific, measurable, achievable in, realistic time (SMART) Goals*** (Bianco-Mathis et al., 2002; Kamarudin et al., 2020).

When one considers the context of BINFOC in academia, the theory that governs adult learners or andragogy must be entertained irrespective of the mentoring model. Vygotsky's theory of the "zone of proximal development" (ZPD), a seminal piece of work related to mentoring, illuminates the area between what an individual is capable of achieving solo and what he or she is capable of accomplishing collectively (Vygotsky, 1978). Mentors have the most significant impact on advancing competence in the mentee as they will be better equipped to judge the distance or zone of proximal development.

Uses of Mentoring

According to Merriam-Webster's online dictionary (2022a; 2022b), mentoring is defined as a mentor (trusted counselor or guide) providing influence, guidance, and direction. Cambridge Dictionary (2022) defines mentoring as the act of helping and giving advice to a less experienced person in a job or at school. Mentoring has been based primarily on Kram's psychosocial and career functions that occur within relationships with a four-phased framework for mentoring [initiation, cultivation, separation, and redefinition (Kram, 1985)].

First, the initiation phase is a period of six months to one year, where the relationship starts. Second, the cultivation phase is defined as two to five years, during which the range of career and psychosocial functions expands to a maximum. Third, the separation phase typically lasts six months to two years following a significant change in the structural role relationship and in the emotional experience of the relationship. Finally, the redefinition phase is the infinite period following the separation phase. In this phase, the relationship ends or takes on significantly different characteristics that include the relationship becoming a peer-like friendship (Kram, 1985). See Table 1 for a description of types of mentoring. Mentoring is a multidisciplinary phenomenon that began as a popular business concept (Hodgson & Scanlan, 2013; McBurney, 2015) and is defined as "a dyadic communication relationship where the mentor provides both verbal and nonverbal behaviors to give support and meet the needs of their protégés "(Lefebvre & Redien-Collot, 2013, p. 371). Across four disciplines of academic medicine, social sciences, education, and nursing, these practices and relationships will be explored.

Academic Medicine

Ke et al. (2022) define mentorship as the provision of guidance by a mentor (more experienced person) to a mentee (less experienced person) that occurs formally or informally. This bidirectional process enhances abilities and builds capacity to produce the desired career outcomes (Burgess et al., 2018). According to Radna et al. (2019), mentoring is a dynamic, context-dependent, goal-sensitive, and mutually beneficial relationship between an experienced clinician and junior clinicians to advance the mentee's development. Mentorship in medical education supports individualistic learning and preparation for the realities of clinical practice (Dalgety et al., 2017).

Social Sciences

A comprehensive definition of mentorship is a personal relationship involving a more experienced faculty member or professional acting as a guide, role model, teacher, and sponsor to a less experienced graduate student or junior professional (Johnson, 2002). Mentoring involves distinct and deeper engagement based on the mentor's thorough understanding of one's mentee and personal career aspirations (Montgomery, 2017). A mentor guides and supports the development of the mentee's professional career through a career-related function, such as providing advice to enhance professional performance and development, and psychosocial function, such as being a role model and support system (Hussey & Campbell-Meier, 2021).

Education

Mentoring is used in various educational contexts that include K-12 schools to higher education. Mentoring is defined as one colleague supporting the skill and knowledge development of another by guiding that individual based on their own experiences and understanding of best practices (American Institute of Research, 2015). Mentoring is a mutually beneficial relationship that provides social support and fosters the mentee's development to become an effective educator using best educational practices (Lucey & White, 2017).

Nursing

Mentorship in nursing is defined as a therapeutic relationship consisting of a dyadic, long-term, and reciprocal process that exists between experienced (senior) nurses and less experienced (junior) nurses or nursing students to facilitate their gaining more knowledge or experience in the profession (Shaikh, 2017; Olaolorunpo, 2019). The purpose of mentorship is to promote knowledge and skill acquisition, provide psychosocial and emotional support, and foster both personal and professional development for effective role change in the nursing profession (Shaikh, 2017). Increasing trust, confidence, role satisfaction, and giving back are some examples of mentorship effectiveness for both the mentor and mentee (Kramer et al., 2021).

Integration of Historical Research

This concept analysis uniquely integrates historical research to elucidate the ultimate case, the model case depicting the concept of interest, mentoring BINFOC toward leadership excellence. Mentoring, which has historically been centrifugal to the professional progress of BIPOC in the United States, was a core reason for the inception of the Association of Black Nursing Faculty. Therefore, integrating historical research or historiography is a sound strategy to illuminate a model case of the concept of interest. Historical research attempts to

systematically recapture and analyze complex constructs, nuances, or ideas that have influenced and shaped the present and will continue to affect the future (Lune & Berg, 2017). The eight steps of historical research guided the construction of the model case of the concept analysis (See Table 2). The data for the historical research included published primary and published secondary sources and artifacts from the Association of Black Nursing Faculty, Inc. archives. Institutional review board (IRB) oversight was not required because no human subjects were involved in the data collection process. The data is limited to published manuscripts and documents.

Results

Defining Attributes

Defining attributes are characteristics that appear repeatedly and most narrowly differentiate a concept of interest from related concepts (Walker & Avant, 2019). For example, Olorunfemi (2019) deduced six major defining attributes of mentoring nurses,

role model, ***nurturing***, ***friendship***, ***experienced person, regular meeting***s, and ***endurance.***

Undoubtedly, each of the reference attributes is important when mentoring nurses. More specifically, Pfund and colleagues(2016) extrapolated attributes for effective mentoring relationships among underrepresented minority groups which evidence indicates to be crucial for the often omitted empirical evidence from research studies. Furthermore, Pfund et al. delineated a list of five attributes, measurable objectives, and assessment metrics for effective mentoring. For the purpose of this concept analysis, we have adopted Pfund and colleagues' (2016) five proposed attributes for effective mentoring relationships ***1) research, 2)interpersonal, 3)psychosocial and career, 4) culturally responsive/diversity, and 5) sponsorship*** (See Table 3).

Model Case

A model case displays all the defining attributes of a concept (Walker & Avant, 2019). Specifically, the five attributes of an excellent mentor delineated by Pfund and colleagues (2016) will be used as the framework for the presentation of the model case. Often case presentations are hypothetical. However, the model case presentation presented in this paper is an account of a ***transformational mentor,*** **Dr. Sallie Tucker-Allen** (See Table 3).

Research

Dr. Sallie Tucker-Allen, the founder of the Association of Black Nursing Faculty, Inc., is a visionary leader who found a major gap through a needs assessment over three decades ago; no nursing organization existed to foster the professional development of Black nursing faculty. Dr. Tucker-Allen's dissertation, ***Commitment of leaders of Nursing,*** identified the 42 Black Faculty members teaching in eighteen National League for Nursing (NLN) accredited baccalaureate nursing schools in Illinois. On September 6, 1986, she invited 42 faculty members to her home, and 21 responded. A Planning and Advisory Committee drew up the constitution and by-laws from this group of women. On March l, 1987, the by-laws were ratified, and the Association of Black Nursing Faculty in Higher Education, Inc. became an official organization. The name was later shortened to the Association of Black Nursing Faculty, Inc.(ABNF). The First Annual Meeting was held in Washington, D.C., on August 6, 1988. True to its purpose, the theme of the first meeting focused on "Funded Nursing Research: A Critical Issue for Black Faculty," with Dr. Ada Sue Hinshaw, then director of the National Center for Nursing Research, now the National Institute of Nursing Research, as the first Keynote speaker (Tucker-Allen, 1997c).

Interpersonal

Standing on the shoulders of giants, and herself now one of those giants, Dr. Tucker-Allen enlisted assistance from leaders such as Drs. Elizabeth Carnegie, Margaret Beard, Gloria Smith, and Rhetaugh Dumas to ensure ABNF had a solid and unshakeable foundation. Since the first meeting in 1988, Dr. Tucker-Allen and ABNF members have organized an annual scientific conference on the discipline of nursing and the delivery of healthcare (Edwards, 2012; McNeal, 2012; Tucker-Allen 1997b, 1997c).

Psychosocial and Career

Dr. Tucker-Allen has held several leadership positions. These include Interim Dean, Assistant Dean, and Professor at the College of Health Sciences at Chicago State University, Director of the School of Nursing at Methodist

Medical Center, Department Chair at Delaware State College, Chair of the University of Wisconsin Green Bay department of nursing, member of the Minority Nurse Leadership Council for the Division of Nursing at the United States Department of Health and Human Services, Chair of the National League for Nursing's Taskforce on Cultural, Ethnic, and Racial Diversity, and most importantly, the founder of the Association of Black Nursing Faculty, Inc. (Tucker-Allen, 1997b; Tucker-Allen, 1997c; McNeal, 2012).

Minority faculty have unique needs as they adjust to roles as faculty and nurses (Amankwa & Elliott, 2018; Jones & Tucker-Allen, 2000). There are many organizations, but few are as sensitive to the challenges of minority faculty as the ABNF. This organization was a product of the vision of Dr. Sallie Tucker Allen (Tucker-Allen, 1997b). Her goal was to provide a venue for minority nurse educators to share experiences, challenges, and resolutions. In addition, this organization offers the opportunity for nurse scholars nationally and internationally to collaborate and network. Each year, conferences are held in major cities in the United States or internationally, with opportunities for peer-reviewed research to be presented. Leadership opportunities, scholarships, fellowships, and peer support are the gold standard for ABNF. Dr. Tucker-Allen is passionate about the need for academics and researchers to understand the amazing resources available among minority faculty (Tucker-Allen, 1997c, 1997d). To this end, she published the *Directory of Minority Nursing Faculty* to provide a resource for others who wish to contact and engage minority nurses in the continued quest to achieve diversity and decrease healthcare disparity (McNeal, 2012; Amankwaa & Elliott, 2018; Tucker-Allen, 1999. 1994, 1990).

Further recognizing the need to establish a mechanism by which the often-muted voice of the minority nurse academician could be heard, in 1987, Dr. Sallie Tucker-Allen founded Tucker Publications, Inc (TPI). Since then, TPI has been a leading publisher of three peer-reviewed journals: *The ABNF Journal, the Journal of Cultural Diversity, and the Journal of Theory Construction & Testing* (McNeal,2012). These publications collectively have disseminated the scientific work of a diverse nursing professoriate with a singular focus to address healthcare research concentrating on the health needs of minority patients and communities. For the past three and one-half decades, TPI has been dedicated to showcasing the work of nurses, healthcare educators, and practitioners. In addition to its three peer-reviewed journals, until 2021, TPI produced one bi-annual newsletter and has published four books and four minority nurse faculty directories (Amankwaa & Elliot, 2018; McNeal, 2012).

In 2021 there were a total of 60 members of TPI's three editorial boards, twenty-two percent of whom held the American Academy of Nursing's distinction of "fellow" (FAAN), the highest honor bestowed by the discipline of Nursing. Additionally, in 2021, members of the TPI editorial boards represented 34 universities across the contiguous United States, Puerto Rico, Australia, and Qatar. They were a diverse group of nursing and healthcare professionals whose ethnic heritage includes: Black Americans, Asian Americans, Hispanic Americans, and Native Americans. TPI has published more than 1400 articles for more than three decades. Among the vanguard of nursing and healthcare professionals, these authors have reported the outcomes of their research findings, covering a broad spectrum of issues that disproportionately affect minority communities, including healthcare inequities, implicit bias, social injustice, discrimination, and poor healthcare access and outcomes, to name a few**.** The articles published in TPI journals have been widely cited, earning a significant impact score determined by the H index SCI ranking.

Additionally, TPI publications have been instrumental in assisting its authors and contributors to achieve tenure, promotion, and appointment at prestigious universities and academies as recognized nursing scholars worldwide. This visionary minority nurse-owned publishing house has been the avenue by which the voice of minority nurse scholars resonates. The fruit of Dr. Sallie Tucker-Allen's career of mentoring nursing faculty of color toward leadership excellence continues through the reorganization of the ABNF Journal to the sustainable and continued mission to:

> *(a) serve as a vehicle for the publication of original research. Furthermore, other health-related manuscripts, materials, and reviews written by minority and non-minority nursing faculty members in higher education; (b) communicate these research and other*

findings to the membership of ABNF and interested others; (c) serve as a linchpin for Black nursing faculty members with similar research interests; and (d) aid Black nursing faculty members in keeping current on research related to Black health care issues long neglected by other nursing publications.

Culturally responsive/diversity

Dr. Tucker Allen has consistently demonstrated a passion and sensitivity to mitigating deleterious trends in the retention of minority nursing students (Tucker-Allen, 1989; Tucker-Allen, 2005; McNeal, 2012; Edwards, 2012; Amankwaa & Elliot, 2018). There are limited minority faculty in leadership positions in colleges and schools of nursing to mentor and nurture aspirational minority nurses and faculty(Tucker-Allen et al., 1992;Tucker-Allen, 2000). Dr. Tucker-Allen is a beacon of support, encouragement, and leadership for novice nurses and educators. She does this in several ways. First, Dr. Tucker-Allen assists minority faculty in disseminating their work through Tucker Publications, Inc., one of only a few minority-owned journals. *The ABNF Journal,* The *Journal of Cultural Diversity, An Interdisciplinary Journal* (H Index 241), and the *Journal of Theory Construction and Testing* provide a venue for minority nurse researchers to present their scholarship (McNeal, 2012). These journals publish articles on many relevant issues, such as minority health, education, social support, international health, and leadership. Many of the authors are new to academia and publishing; knowing this, Dr. Tucker-Allen has in place a network of resources to promote success for the new author (Tucker-Allen, 1997a). However, her most important contribution is her energy, passion, and strength as she works tirelessly to help others reach the height of their career. She believes in junior nursing faculty of color, and a remarkable transformation takes place- BINFOC begin to believe in themselves. Her ability to give this transformative gift has resulted in many minority nurses becoming leaders—many credit Dr. Tucker-Allen's passionate leadership and mentoring as transformational (Edwards, 2012).

Sponsorship

Dr. Sallie Tucker-Allen has sponsored or supported the sponsorship of scores of nursing faculty of color to attain membership in the most prestigious body of nurse scholars in the United States, the American Academy of Nursing. In 2021 there were a total of 60 members of TPI's three editorial boards, twenty-two percent of whom held the American Academy of Nursing's distinction of "fellow" (FAAN), the highest honor bestowed by the discipline of Nursing. Additionally, in 2021, members of the TPI editorial boards represented 34 universities across the contiguous United States, Puerto Rico, Australia, and Qatar. They were a diverse group of nursing and healthcare professionals whose ethnic heritage includes: Black Americans, Asian Americans, Hispanic Americans, and Native Americans. TPI has published more than 1400 articles for more than three decades. Among the vanguard of nursing and healthcare professionals, these authors have reported the outcomes of their research findings, covering a broad spectrum of issues that disproportionately affect minority communities, including healthcare inequities, implicit bias, social injustice, discrimination, and poor healthcare access and outcomes, to name a few**.** The articles published in TPI journals have been widely cited, earning a significant impact score determined by the H index SCI ranking. Additionally, TPI publications have been instrumental in assisting its authors and contributors to achieve tenure, promotion, and appointment at prestigious universities and academies as recognized nursing scholars worldwide.

Borderline Case

The following hypothetical borderline case displays some but not all of the defining attributes (Walker & Avant, 2019). A borderline case is closely connected to the case; however, some differences distinguish them from the concept being studied (Walker & Avant, 2019). The following is a hypothetical borderline case to demonstrate the dissimilarity between effective mentoring.

Dr. Elise is a new faculty of color hired on the tenure track at a university. One of the College of Nursing's strategic initiatives is to increase the number of faculty of color by 3% within four years. As part of this initiative, the College developed a formal mentoring program, set aside funding to support faculty development, and startup funds for new tenure-track faculty. In the first six months, every new tenure track faculty is expected to identify

two tenured faculty as mentors within the college and university. The new faculty must submit a research agenda and proposal, which the college's dean must approve to receive startup research funding. Dr. Elise must apply for external research funds in the first two years. The new faculty must attend and present at a minimum of one national conference each year. Dr. Elise identified two white tenured nurse faculty mentors and established a regular schedule to meet with the mentors. They established a meeting schedule and set expectations for the two-year mentoring experience. Her mentors kept all appointments except one and made an effort to listen to Dr. Elise's plans for professional development and offer advice. The mentors were supportive and often nurturing.

Although Dr. Elise's research aligns with one of her mentors' research, Dr. Elise was not invited to participate in writing and submitting a HRSA grant or coauthoring any of the manuscripts they published during the two-year mentorship. Dr. Elise was told that because she has elected to focus on a specific minority population, it would be inappropriate to include her in the grant and publication. The mentors encouraged her to find smaller funding sources that align with her research interest. One mentee invited her to attend a national conference once during the two-year period. Dr. Elise and the mentors worked together to identify professional development opportunities for her grant writing workshops. They offered her feedback on revising and submitting her doctoral dissertation manuscript for publication. She was encouraged to expand her professional network through conferences; however, she was not introduced to other leaders within the mentors' network. Dr. Elise Joined the Association of Black Nurse Faculty (ABNF)at the urging of one of her colleagues. Through the ABNF, Dr. Elise connected with many nursing faculty of color and received support and resources not provided by her mentors.

Dr. Elise's story exemplifies a borderline case, where only three of the five attributes for optimal research mentoring of nursing FOC. Although Dr. Elise's approved mentors met with her regularly and listened to her goals for the mentoring relationship, they failed to provide an opportunity to engage in collaborative work with them by excluding her from the HRSA grant application and publications. By excluding Dr. Elise from the grant proposal and publication, the mentors failed to elevate the voice of a minoritized person continuing the long tradition of silencing and failing to elevate the voices of ethnic minority nurses in academia. Although the mentors encouraged Dr. Elise to expand her network, they did not introduce her to their established network or facilitate relationship-building within their already existing network (Iheduru-Anderson & Shingles, 2023). Dr. Elise sought help from other resources, joined an ethnic professional nursing organization-ABNF, and identified and established a new professional network. Although Dr. Elise recognized the stereotype associated with being an African American Researcher and focusing her scholarships on African Americans, her mentors were unable to provide culturally responsive mentorship and failed to employ effective strategies to manage biases and equity and inclusion issues that occurred in the relationship.

Contrary Case

The following **hypothetical** contrary case is a clear example of what mentoring nursing faculty of color is not (Walker & Avant, 2019). The contrary case is a situation in which the opposite of the concept is under consideration. Dean Martha is the dean of the College of Nursing in a predominantly white institution (PWI). Blacks and other students of color comprise 75% of the student population. However, only 5% of the faculty is non-white. Dr. Tawana Jones applied for tenure and promotion to associate professor two months ago. Dean Martha, however, refused to provide or declined to provide support for Dr. Jones' promotion and tenure application. Dean Martha lamented that Dr. Jones's research focused too much on the effect of systemic racism on the persistent health disparities among African American communities. Dean Martha emphasizes that the faculty must have balance and “move forward from that stuff!" Dean Martha further laments, "I have spoken with Dr. Jones, but she insists that this 'woke stuff' is her research passion and will remain her trajectory and that she will remain on this trajectory. Well, not in my College of Nursing! We will be normal here! And do the regular type of stuff. This is not a 'CRT-friendly'‘' woke' College of Nursing! Dr. Jones and her cronies have said they will file an EEOC complaint; they can just go ahead! My husband's uncle is the president of the university, and his father is on the Board of

Regents. And if that is not enough, my cousin is the governor of the state. So, if she wants to do normal stuff like participating in the nursing Honor Society and sponsoring the nursing student association for undergraduate nursing students, that is fine. And, if she wants to publish in journals that all nurses read, that is fine. I won't give her any credit for those publications and those black nursing faculty journals. And, if she wants to go back and present at conferences, she can go to the general, regular state nurses association, or even the national nurses association and present. Even though I do not think she will get her abstracts accepted. You know those people do not tend to write very well, and I do not have time to spend writing it for her myself. And I do not connect with her very well. We do not have that interpersonal connection. She is just so different!"

This **hypothetical** scenario fails to depict any of the defining attributes of mentoring nursing faculty of color. First, Dean Martha failed to support and encourage Dr. Jones' **research** trajectory**.** Additionally, Dean Martha does not display compassion and interest in Dr. Jones' ***career and psychosocial*** well-being. Furthermore, Dean Martha generously accepts underserved minorities into the entry-level nursing program. However, she refuses to enact focused recruitment and retention strategies, stating that we are beyond all that focus on cultural responsiveness and diversity. Lastly, Dean Martha does not support ***sponsorship***.

Antecedents

Walker and Avant (2019) defined antecedents as events or incidents that must be present before the concept can occur. Antecedents help explain the social contexts in which the concept materializes.

An effective mentoring experience results from a combination of numerous factors. Some critical elements of effective mentoring relationships include effective communication, clear expectations, trust, and support. Effective communication includes not only actively listening but also providing responses and feedback in a timely manner. At the start of the mentoring experience, the mentor and mentee should clearly identify their expectations for the mentoring relationship. Trust should be built for both the mentor and the mentee. Finally, support includes fostering a sense of independence and promoting activities that facilitate professional development (Byars-Winston & Dahlberg, 2019; Pfund et al., 2016).

Consequences

Consequences are the outcomes resulting from the occurrence of a concept (Walker & Avant, 2019). Consequences often stimulate innovative ideas or research directions related to specific concepts. For example, BINFOC, who experience effective mentoring, experience greater longevity and fulfillment. Specifically, the positive consequences of mentoring nursing faculty of color toward leadership excellence are exemplified in the products from our model case's works. See Table 4 for selected articles in which mentoring exists in the title that were published in TPI journals.

Empirical Referents

The last step of the concept analysis is to define the empirical referents (Walker & Avant, 2019). Empirical referents are categories of actual phenomena that, by their existence or presence, demonstrate the occurrence of the concept itself (Walker & Avant, 2019). In assessing mentorship's impact, short-term outcomes, which include career satisfaction, productivity, recruitment, work-life balance, and organizational climate, and long-term outcomes, which include promotion, retention, and organizational culture, should be assessed (Nowell et al., 2017). Moreover, the knowledge and skills obtained are essential outcomes of the measure (Olaorunpo, 2019). Subjective outcomes are generally measured by participant self-report. Self-report is the most used referent for mentoring in nursing (Stewart & Krueger, 1996). Therefore, a collection of qualitative and quantitative data is recommended (Nowell et al., 2017). Empirical referents are categories of actual phenomena that, by their existence or presence, demonstrate the occurrence of the concept itself (Walker & Avant, 2019).

Various tools have been developed to measure the effectiveness of the mentoring relationship. Given the different types of mentoring, mentorship outcomes may differ across settings in nursing, especially academia, and are less mature in nursing (Chen et al., 2016; Nowell et al., 2017). Meagher et al. (2011) emphasized the need for evaluation and new measures to be developed. *The Mentorship Relationship Effectiveness Scale,* developed by a Johns Hopkins University College of Nursing Faculty Mentoring Committee is a 12-item Likert scale which evaluates the behavioral aspects

of the mentor (Berk et al., 2005). The same group developed a second scaled in which the mentee's perspective is assessed via the *Mentorship Profile Questionnaire* (Berk et al., 2005). Another mentor-focused measure, the 26-item *Mentoring Competency Assessment*, evaluates six areas of mentor competency, 1)maintaining effective communication, 2) aligning expectations, 3) assessing understanding, 4) addressing diversity, 5) fostering independence, and 6) promoting professional development (Fleming et al., 2013). Lastly, a newer 10-item tool, The *National University Hospital Mentorship Evaluation (NUH ME)* measures mentorship as perceived by graduate nurses (Tiew et al.,2017). Although the empirical referents of mentoring nursing faculty are proliferating, ***a dearth remains in the presence of valid and reliable empirical measures of mentoring BINFOC toward leadership excellence.***

Implications for Nursing

Research

Mentoring is the social foundation of research. In the absence of mentoring, junior faculty face the challenge of navigating the research enterprise in isolation, which can be scary and unnerving (Byington et al., 2016). Mentoring a junior faculty in research includes sharing knowledge and skills, overseeing the mentee's work, helping them contact other researchers, and assisting with career counseling (Talbert et al., 2021). The ideal research mentor will assist the mentee in pursuing career goals and acquiring the requisite technical, professional, and social skills for conducting research in a particular field. In addition, the ideal mentor challenges the mentee, encouraging the mentee to higher scientific achievement (Lanzi et al., 2019).

Effective mentoring is critical to the academic success of early career scholars (Talbert et al., 2021). Davis et al. (2022) reported barriers to successful mentoring faculty of color, such as difficulty finding suitable mentors, negative mentoring experiences, insufficient institutional support for formal mentoring, and lack of post-tenure mentorship among tenured faculty. Faculty of color in academia report better research mentoring experience when they have mentors with shared racial/ethnic backgrounds because they tend to have positive communication and do not undervalue the research productivity of the mentee (Busby et al., 2022).

Few studies have investigated mechanisms for accurately measuring the concept of mentoring nursing faculty. Therefore, it is imperative that original studies specifically evaluate the attributes of effective mentoring. Pfund and colleagues (2016) delineate the *"Next Steps Research*" needed to test the five attributes of mentoring relationships that emerged from their study. Interventions to facilitate the development of healthy mentoring relationships may be designed based on substantive attributes**.**

Strong evidence through qualitative and quantitative examination is required to evaluate the impact of mentoring, which may yield rich descriptions of the lived experiences of mentoring and survey data along with psychometric properties such as reliability and validity.

First, future work should include faculty of color. A qualitative examination can facilitate a better understanding of the perspectives of mentors and mentees from diverse backgrounds. Quantitative examination, specifically an experimental design, can confirm causality between mentoring and its outcomes (Tiew et al., 2017). Second, future work focusing on the outcomes measured can better inform effective mentorship strategies (Nowell et al., 2017).

Practice

There is a direct link between the lack of nursing faculty and the shortage of qualified practicing nurses (Bakewell-Sachs et al., 2022). For the nursing workforce to reflect the racial diversity of the United States, large-scale effective mentoring programs must be established at different levels and supported through federal agencies and private/philanthropic organizational funding. The criteria for participation in funded mentoring programs must consider the structural and systemic challenges that limit the participation of underrepresented students and nurses in these programs. Students of color entering the nursing profession must have an academic environment in which students of color feel represented by seeing themselves reflected in the faculty and academic leaders (Iheduru-Anderson, 2020). A formal mentoring program supported and funded through the institution to support students of color through school and transition into practice.

Education

Nursing schools continue to report full-time nurse educator vacancies above 8% (AACN, 2022).

As the need for qualified nurse faculty continues to increase, nurses of color remain underrepresented in nursing education, consisting of only 17.3% of all nurse faculty (Lee et al., 2017). Maintaining a robust supply of qualified faculty is an ongoing challenge for the nursing profession and a barrier to graduating more new nurses (Wynnet., et al. 2021). Further, as the population of the United States becomes more diverse, it is vital to educate a nursing workforce that reflects diversity to meet complex healthcare needs. Recruitment and retention of nursing faculty reflect that there is a direct correlation between positive mentoring and the increasing shortage of experientially qualified educators and mentors (Evans, 2019). Specifically, effective mentoring of educationally qualified BIPOC nurses or mentoring to guide BIPOC nurses toward academic nursing directly affect the nursing shortage (Wynn et al., 2021). Mentoring in academia promotes the retention of students and future faculty, thereby increasing the nursing workforce (Duquesne University, 2020).and will help alleviate the nursing faculty shortage (Wynn et al., 2021). Further, how BIPOC faculty mentor one another as a novice and seasoned faculty can directly impact individuals' desires to pursue nursing as a profession and influence what students see as they learn from us (Campbell & Deming, 2019). Nurses who feel they are not supported are likely to leave the profession contributing to the ongoing nursing shortage (DeWitty, & McCamey, 2022). The problem is further complicated if there is a lack of mentors in healthcare as a whole that have the ability or willingness to mentor future generations of faculty. Mentors are needed to pass on knowledge and promote the retention of students and faculty in academia. This further supports mentoring in academia as a vital part of retention in the healthcare profession (Wynn et al., 2021). In contrast, the lack of mentoring will continue to contribute to the shortage of nursing in the overall profession for years to come. Moreover, mentoring is one strategy to assist in advancing academic careers and helps racially, and ethnically diverse faculty achieve career success (DeWitty & McCamey, 2022). Mentoring is crucial to support BIPOC faculty as they have increased difficulty achieving success because of the effect of marginalization (Steffen-Fluhr, 2012). However, given the shortage of nursing faculty at baseline, the chances for BIPOC faculty to establish a mentoring relationship within the same institution are often challenging. These difficulties underscore the importance of mentorship and a network of support. Creating faculty-mentor connections often requires creative, nontraditional approaches (Campbell & Deming, 2019).

The National Academy of Medicine's report on the Future of Nursing 2020-2030 calls on nursing schools to increase their efforts to recruit, support, and mentor faculty from diverse backgrounds (National Academy of Sciences, Engineering, and Medicine, 2021). Increasing the number of Black nurses in faculty roles is an added means to advancing health equity for all. In addition, mentoring Black nurses and other nurses of color is critical to the development of leadership attitudes and skills necessary for effective leadership (Iheduru-Anderson & Shingles, 2023).

Policy

Many nurses graduate from nursing programs with little to no training in policy and the role of nurses in shaping healthcare policies. Mentoring is critical for all nurses, especially those from underrepresented groups. Participation in public policy and advocacy can help shape the future of nursing concerning equitable access to resources and opportunities (Amankwaa & Elliot, 2018). Effective mentoring of nurses of color is critical for nursing workforce diversity at the leadership level. Through participation in health policy mentoring programs, Black nurses will gain the knowledge and skills required to shape and advance policies that affect their communities. Mentoring nurse faculty of color requires acknowledgment of the decades of disenfranchisement that led to the underrepresentation in nursing at all settings and levels. Same-race mentors remain elusive for many Black faculty. They must depend on their white peers to gain access to the social capital required to build a strong network necessary for career advancement in nursing (Iheduru-Anderson & Shingles, 2023).

Conclusion

This analysis, featuring historical research illuminating the 35 year legacy of a ***transformational mentor*** of BINFOC, Dr. Sallie Tucker-Allen, highlights that a comprehensive definition of mentoring BINFOC toward leadership excellence is warranted to advance inclusive excellence. In

agreement with Zerai and López (2022), diversity at colleges and universities continues to increase in the United States. Therefore, developing faculty from traditionally underrepresented backgrounds in higher education is critically important. Many yearn to learn more about mentoring early-career faculty, staff, and students who are from underrepresented and marginalized backgrounds. In nursing, mentorship has a more specialized focus and is less mature (Chen et al., 2016). In agreement with the literature, mentoring is one strategy to assist in advancing academic careers and fosters racially and ethnically diverse faculty to achieve career success by addressing the identity, self-efficacy, and cultural capital development needed to navigate research communities of practice (DeWitty, & McCamey, 2022; Wynn et al.,2021).

Strong evidence through qualitative and quantitative examination is required to evaluate the impact of mentoring, which may yield rich descriptions of the lived experiences of mentoring and survey data along with psychometric properties such as reliability and validity. As a well-established organization with dedicated leaders and mentors, The Association of Black Nursing Faculty (ABNF) is committed to supporting BINFOC academicians and professional nurses with similar credentials, interests, and concerns of health-related issues and educational interests for the benefit of themselves and the BIPOC community (2022). While mentoring in academia can take many forms, it is imperative to recognize that mentoring involves building a mentorship model that addresses how to meet the challenges of successful promotion and tenure for BINFOC. In addition, designing mentoring efforts to support BINFOC by actively employing strategies to attenuate bias may create a more inclusive learning and scholarly environment in higher education.

Future researchers should consider using an experimental design to confirm the causality between mentoring and its outcomes (Tiew et al., 2017). Future work on the outcomes measured can better inform effective mentorship strategies (Nowell et al., 2017). This concept analysis provides insight into the characteristics of a *model case* of mentoring BINFOC toward leadership excellence and the vital role individually and through her far-reaching venues; the ABNF and TPI. We deduce from our analysis that mentoring BINFOC toward leadership excellence, the definition,

The provision of culturally sensitive and tailored support to junior peers within and outside one's organization that aids in the development of a career plan and sharing opportunities that aid in successful transition across their career through effective communication, regular meetings discussing career development plan including short- and long-term goals, and sharing insight on training activities to meet these goals.

Table 1

Description of the Types of Mentoring

Type of Mentoring	Definition
Formal mentoring	Planned, structured, and intentional to target gaps and resolve problems in programs and organizations.
Informal mentoring	Initiated naturally between mentors and mentors.
Diverse mentoring	A joining between mentors and mentees that differ demographically and have mixed interests.
Electronic mentoring	Mentoring that occurs remotely using technology such as social media platforms, cloud-based or virtual (online) platforms, electronic mail, or synchronous chats.
Co-mentoring/collaborative mentoring	A mutually beneficial relationship built on reciprocity.
Group mentoring	Involves multiple perspectives and team-based strategies where peer modeling and learning, performance, and goal attainment are supported.
Peer mentoring	Involves informal or formal developmental learning to individuals that are new to an event or experience and individuals with experience.
Multilevel mentoring	Occurs across organizational levels to promote change-oriented practices.
Cultural mentoring	Encourages cross-cultural relationships within diverse environments.

Adapted from Mullen & Kilmaitis (2021).

Table 2 Integration of Historical Research in Concept Analysis

Walker & Avant's Concept Analysis Steps	Lune and Berg's Historical Research Steps
1. Select a concept	
2. Determine the Aims of the Analysis	
3. Identify Uses of the Concept	
4. Determine Defining Attributes	
5. Identify Model Case	1. Identify a idea, topic, or research question. 2. Complete a background literature review. 3. Refine research idea and questions. 4. Determine historical methods to be the data collection process. 5. Identification and accessing primary and secondary data sources. 6. Evaluate authenticity and accuracy of data. 7. Code and interpret materials related to the research question. 8. Analyze the data and develop a narrative exposition of the findings
6. Identify Additional Cases	
7. Identify Antecedents and Consequences	
8. Determine Empirical Referents	

Adapted from Walker & Avant (2019) and Lune & Berg (2017)

Table 3 Demonstration of Mentoring Attributes in Model Case

Attributes	Measurable Objectives	Demonstrated in the Model Case - Dr. Tucker-Allen
Research	➔ Developing disciplinary research skills ➔ Teaching and helping research self-efficacy ➔ Developing technical skills ➔ Accurately assessing understanding of disciplinary knowledge and skills ➔ Valuing the practice of ethical behavior and responsible conduct of research ➔ Developing mentee research self-efficacy	➢ Founded ABNF, Inc. 1987 ➢ Annual ABNF Scientific Conferences since 1988 - Junior faculty and Student friendly podium and poster sessions ➢ Refereed publications ○ ABNFJ ○ Journal of Cultural Diversity ○ Theory Construction and Testing Journal Jr. faculty and student friendly
Interpersonal	➔ Listening actively ➔ Aligning mentor and mentee expectations ➔ Building trusting and honest relationships	Listened to nursing faculty to actualize a "Gem of An Idea-ABNF" ➢ Published Directories of Minority Faculty
Psychosocial and Career	➔ Providing motivation and facilitating coping efficacy ➔ Developing mentee career self-efficacy ➔ Developing science identity ➔ Developing a sense of belonging	➢ Awards and scholarships recognizing excellence presented annually at ABNF Conferences ➢ Webinars and special sessions to support strategies for promotion and tenure. ➢ Networking
Culturally responsive/diversity	➔ Advancing equity and inclusion ➔ Being culturally responsive ➔ Reducing the impact of bias ➔ Reducing the impact of stereotype threat	➢ Public policy position statements ➢ 2023 Inaugural Public Policy Fellowship
Sponsorship	➔ Fostering independence	➢ FAAN Sponsorship ➢ ~ 25-30% ABNF Membership hold FAAN recognition

Adapted from Pfund et al. (2016)

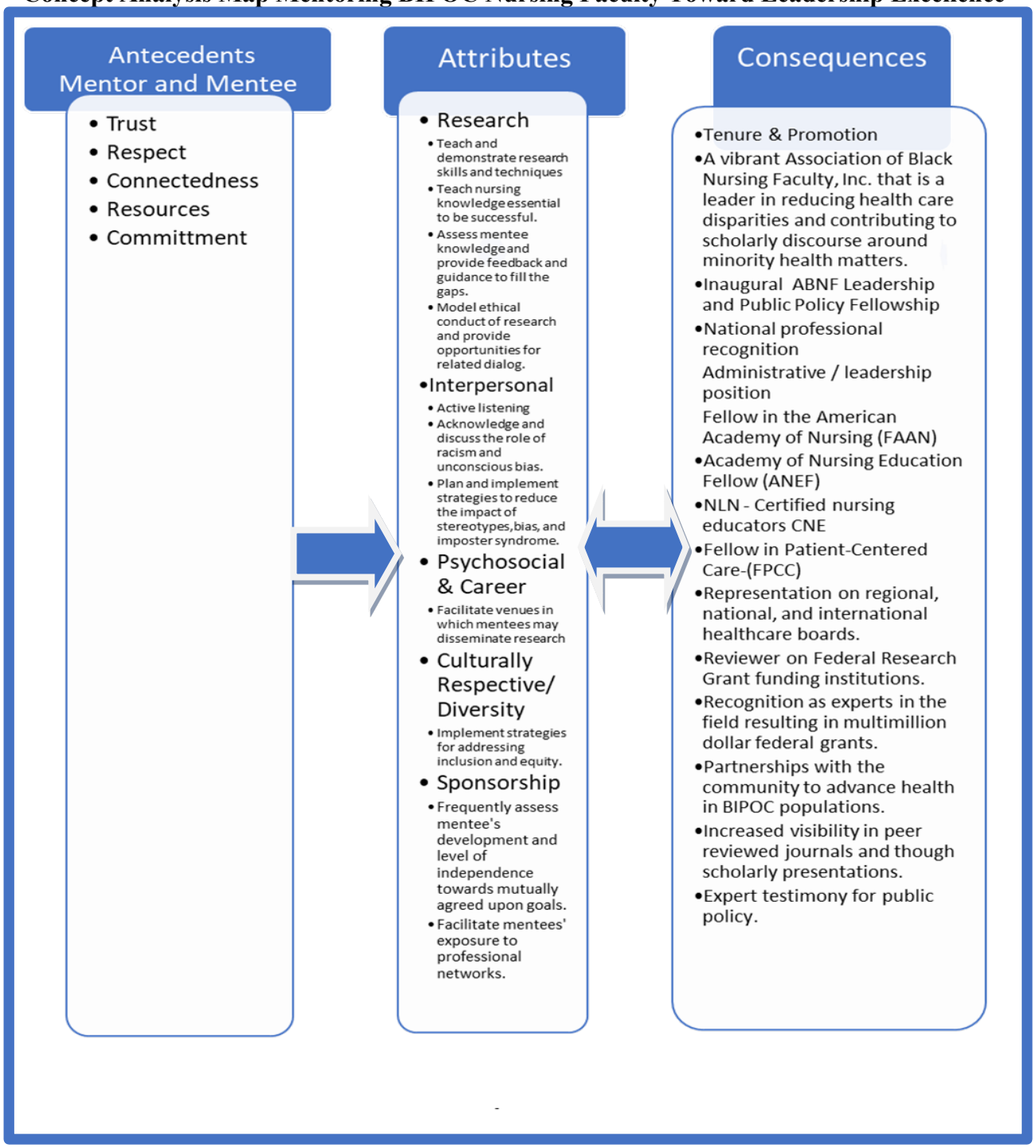
Table 4
Selected Mentoring Peer Reviewed Articles - Tucker Publications, Inc. (TPI) 1992-2019

Author	Title	Citations Google Scholar
Ching, E., OTD, M., O.T.R./L. (2019).	Seeds of change: health science mentoring program for underserved high school students.	2
Mijares, L., Baxley, S. M., & Bond, M. L. (2013).	Mentoring: A Concept Analysis.	97
Wilson, A.H., Sanner, S. & McAllister LE. (2010)	An evaluation study of a mentoring program to increase the diversity of the nursing workforce.	98
Wroten S.J. &Waite R. (2009) Brathwaite D. (2002)	A call to action: mentoring within the nursing profession--a wonderful gift to give and share.	45
Fox OH & Broome BS (2001) Jones DP & Tucker-Allen S. (2000)	Mentoring students: internationally.	2
Tucker-Allen, S (2000) Buchanan BW. (1999). July F.M. (1998).	Mentoring: A supporting act for African American students and faculty.	19
Sharps PW & Benjamin FK. (1997)	Mentor/mentee relationship with the focus on meeting promotion/tenure guidelines.	14
Kennedy P.H. (1997) Gonzalez, L. (1994)	Mentoring: a vital component for nurse faculty recruitment and retention.	2
Tucker-Allen S., Steele R., & Baker S. (1992)	A mentoring pyramid for African American nursing students.	30
Felder E. M (1992)	The Mentoring Program at Fayetteville State University: a key to success for minority students.	3
	Mentoring for publication: faculty and student	5

	perspectives.	
	Bridge mentoring: a teaching model.	4
	Faculty mentors for minority undergraduate students.	10
	Mentoring role of black nursing faculty members	5
	Meeting the challenge of mentoring African American nursing faculty: A strategy for professional development.	8

Figure 1

Concept Analysis Map Mentoring BIPOC Nursing Faculty Toward Leadership Excellence



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The Simulated Virtual Healthcare System Model (SVHSM) Interprofessional Education Project

Abstract

Purpose

The Simulated Virtual Healthcare System Model (SVHSM) Interprofessional Education Project was designed to implement an evidence-based simulation training program, to prepare pre-licensure nursing students for practice in public health and community settings, as members of interprofessional teams, in meeting the HRSA priority: transforming the workforce by targeting the need.

Methods A descriptive study was conducted using an online survey of nursing and health professions students. At the end of an eight-week online seminar series, students were asked to rate their level of agreement with 14 questions measuring satisfaction with content taught, experience engaged in interprofessional teamwork, accessibility of faculty to address learning needs, and the extent to which the experience would be recommended to peers.

Findings A total of 229 ethnically diverse nursing and health professions students, consisting of ten cohorts, completed a 5-point Likert scale survey, where a score of 5 measured the highest level of agreement. A weighted average of the responses across all categories of the survey ranged from 4.17 to 4.55, demonstrating high levels of agreement associated with questions regarding teamwork and group projects, satisfaction with content taught, accessibility of faculty, and the probability that students would recommend the experience to peers.

Index Words: Simulation, Virtual Reality, Augmented Reality, Interprofessional Education

Reliance on simulation-based training, as a powerful learning assessment tool, has been utilized for decades by industries that are mandated to ensure the safe handling of devices, equipment, chemicals, and energy sources. Among those entities within the vanguard has been the aviation industry. The utilization of simulation technologies was developed during World War II, to ensure the expert manipulation of aircraft maneuvers during combat. The extensive use of full-scale training simulators by aviation, space exploration and the military-industrial complex is well documented in the literature (Aebersold, 2016). Use of simulation technologies in the classroom setting is increasingly becoming a mode of instruction in the field of higher education.

Purpose

The Simulated Virtual Healthcare System Model (SVHSM) Interprofessional Education (IPE) Project was designed to implement an evidence-based simulation training program, to prepare pre-licensure nursing students for practice in public health and community settings, as members of interprofessional teams, in meeting the HRSA priority: transforming the workforce by targeting the need. With the growing shortage of nurse faculty and decreased patient length of stay, there are limited opportunities for students to engage in traditional clinical learning experiences. Additionally with the impact of the pandemic, hospitals have canceled clinical affiliation agreements with schools of nursing in an effort to control the spread of infection. Moreover, as healthcare transitions to community-

based settings, nurse faculty have been increasingly challenged to provide students with acute, in-hospital care experiences. The opportunity for IPE learning experiences continues to pose an impediment to actual implementation, due to scheduling of classes across disciplines and competing clinical hours.

Use of Simulation as Replacement for Clinical Experiences

In a study conducted by the National Council of State Boards of Nursing, simulation-based education was shown to be effective in replacing clinical hours for students enrolled in pre-licensure nursing programs (Hayden et al., 2014). The latest advances in the field of gamification have facilitated the utilization of virtual reality to closely approximate real-world experiences, positioning the learner in immersive environments. While traditional learning methodologies emphasize linear thinking, virtual learning clinical scenarios engage student thinking processes in an iterative manner, which facilitates critical interpretation and analyses of multiple data sources. As the discipline of nursing begins to focus on risk analysis, sentinel events, clinical outcomes, patient safety, and medication errors, the utilization of simulated events facilitates the re-construction and analyses of untoward outcomes in a low-risk, virtual setting.

Interprofessional Education

The Institute of Medicine (now National Academy of Medicine) published a report on the impact of interprofessional education (IPE) on healthcare outcomes. IPE is defined as the engagement of two or more health and/or social care professions students learning together to improve collaboration and the delivery of care. Key elements for this approach to learning includes teamwork and the measurement of performance in practice (IOM, 2015). This article describes how simulation-based education (SBE) was used to serve as the methodological approach, engaging interprofessional teams of nursing and healthcare students in virtual, immersive environments for the provision of care in community-based settings (Humbles et al., 2017).

Literature Review

While the literature is replete with research exploring various aspects of simulation use in healthcare among a variety of disciplines, gaps in the science of simulation for the nursing profession remain (Carlson & Gagnon, 2016; Horsley et al., 2018). There are few studies that investigate the effectiveness of simulation-based education and its transferability to nursing practice. Additional studies are needed to examine skill development, skill transfer, and the higher order thinking required in the performance of nursing care in actual patient settings (Persico, 2018). An integrative review conducted by Al-Ghareeb and Cooper (2016) found that in studies led by several countries, including the United States, there were significant barriers to the use of high-fidelity manikins. These barriers included fear of technology; lack of human resources, trained staff and financial support; insufficient number of manikins; additional workload; and, lack of applicability to the curriculum of study. Further, the study found that faculty had insufficient time to become familiar with the technology, to write and run realistic scenarios or to manage the technology while simultaneously teaching students. Factors which seemed to increase the use of technology included training through simulation workshops, conferences, observations, hands-on practice, and mentor feedback. The importance of having a dedicated full-time simulation director was identified as a significant factor in supporting faculty adoption of technology (Al-Ghareeb & Cooper, 2016).

Recent studies demonstrate the effectiveness of simulation-based education in undergraduate nursing programs. Research regarding the effectiveness of simulation has grown from earlier stages when the unit of measure was student self-confidence, to the current metric that evaluates the transference of knowledge and behaviors to clinical practice. With the shortage of faculty and lack of clinical placements, simulation-based education affords the student the opportunity to practice until skill proficiency is achieved, to critically think and reflect on errors, self-correct, and accept feedback in a safe environment. Moreover, the use of virtual simulations has been made possible with the increase in available resources and affordability, as upfront costs have significantly decreased (Aebersold, 2018).

The creation of student-centered simulation experiences presents a significant challenge for faculty. Inexperienced faculty have great difficulty in attempting to implement an innovative student-centered approach to simulation-based education

(SBE). Areas needing development include creation of evidence-based scenarios, ability to assess student performance, managing the debriefing session, and methods used to enhance students' clinical judgment. Further, novice faculty lack strong clinical skills, and clinical judgment (Cockerham, 2015), which is typically acquired after many years of clinical experiences. To address those areas needing development for faculty, Cockerham (2015) implemented a project plan consisting of four main components: faculty workshops, clinical simulations, student assessment, and reflective debriefing. Five faculty participated in two training workshops. The first workshop provided a history and evidence-based practice using simulation in nursing education. The second workshop concentrated on the origins and significance of debriefing. During the simulation phase, faculty had an opportunity to work with two scenarios, which were adapted from the evidence-based learning modules created by Elsevier. Faculty assessed student performance using a valid and reliable instrument. The Debriefing for Meaningful Learning (DML) methodology served as the framework to facilitate non-judgmental and reflective debriefing.

In a study conducted by the National Council of State Boards of Nursing, it was found that high-quality simulation could be substituted for up to 50% of traditional clinical hours. Further, the study noted that a number of systematic and integrative reviews supported the use of simulation as a learning pedagogy (Alexander et al., 2015). Similarly, Persico (2018) conducted a review of studies that investigated the use of simulation-based education substituting for traditional clinical rotations, especially needed at this time given the current shortage of faculty and limited clinical placements. The study noted that it is becoming increasingly more difficult to assess critical thinking and clinical judgment in students, as patient safety, facility imposed reduced faculty-student ratios, and denied access to the EHR severely limit student learning opportunities.

The IOM (2015) report on the impact of interprofessional education (IPE) on collaborative practice and patient outcomes recommended a conceptual model for evaluating IPE that could be adapted to a variety of settings. The report highlighted the need to lay a strong foundation that addressed four areas: (1) more closely aligning the education and health care delivery systems; (2) developing a conceptual framework for measuring the impact of IPE; (3) strengthening the evidence base for IPE; and (4) more effectively linking IPE with changes in collaborative behavior.

Overview of the SVHSM Model Interprofessional Education Project

The International Nursing Association for Clinical Simulation and Learning (INACSL) sets the standards for best practice in simulation. These standards provide the foundation for evidence-based practice in academia, practice and research. The components of the standards include the following required elements: simulation design, outcomes and objectives, facilitation, debriefing, participant evaluation, professional integrity and simulation-enhanced interprofessional education (INACSL, 2021). The Simulated Virtual Healthcare System Model (SVHSM) Interprofessional Education (IPE) Project, in addition to following the INACSL Standards of Best Practice, also aligned the educational component of this model with the critical components of the healthcare delivery system. The SVHSM Project provided the foundation supporting an evidence-based simulation training program, which prepared nursing students for practice in public health and community settings as members of interprofessional education (IPE) teams**.** The Project facilitated the engagement of students representing eight different healthcare disciplines working together in the development of real-world strategies to improve health outcomes. Curricular mapping was conducted to identify the alignment of program learning outcomes for each of the participating disciplines with modular knowledge content areas, to ensure sustainable curricular integration and comparability across disciplines. Additionally, this Project provided simulation-based education (SBE) training opportunities for faculty, and promoted the implementation of an integrated, interprofessional team-based model of care, in designing population-based interventional strategies.

The SVHSM Project innovatively utilized simulation applications to achieve virtual and augmented reality experiences, immersing teams of interprofessional nursing and healthcare students into the real world setting of underserved

communities. To date there has not been the creation of a full-scale virtual reality of an entire healthcare system with a focus on addressing the needs of the underserved. Borrowing from the field of aviation in its use of resource management techniques to improve communication, team coordination, and navigation around sudden inclement conditions and equipment failures, the purpose of the SVHSM Project was to create realistic and challenging scenarios that stimulate critical thinking and effective team performance. The disarray of the current healthcare delivery system was made clearly evident as this nation most recently grappled with the challenges caused by the COVID-19 pandemic. Epidemiological predictive models failed in forecasting the number of beds, personal protective equipment, and ventilators needed for the hardest hit communities. Future public health nurses will need to be better prepared to help guide the nation in managing unforeseen outbreaks, natural disasters, and acts of terrorism.

Virtual and augmented reality technologies were used to immerse the student in simulated community-based settings, designed to challenge interprofessional teams of nursing and health professions students in gaining a better understanding of those societal issues impacting the entire healthcare delivery system. As depicted in Figure 1, the Simulated Virtual Healthcare System Model (SVHSM) was designed to represent the nation's complex healthcare system. This model builds upon the work of Reid and associates (2005), which consists of four interrelated components: 1) healthcare consumers (patients and families); 2) health care providers (clinical professionals and practitioners); 3) health care agencies (hospitals, home-health agencies, health-career schools, clinics, rehabilitation centers, long term care facilities); and, 4) the regulatory and political environment (HMOs, PPOs, insurance companies, CMS, accreditors, federal and state statutes) (Reid et al., 2005).

SVHSM Constructs.

Uniquely adding the conceptual framework of person-centered care, the author-designed SVHSM consists of six constructs, which form the infrastructure and support the design. *The Feedback Mechanism* - As depicted in Figure 1, surrounding the patient/family/community triad, which is positioned at the center of the healthcare team, are the elements of the feedback mechanism, where healthcare administration, interprofessional care providers and information systems interplay and impact both clinical education and healthcare outcomes. *Healthcare Administration* - Health administration professionals work to administer, lead and manage healthcare systems, such as hospitals, hospital networks or large healthcare systems. They are involved in the daily management of the system and collaborate with other professionals in the delivery of care. *Interprofessional Health Care Providers* – There are six categories of health care providers who render direct patient care: primary care physicians (medical doctor, doctor of osteopathy, Christian Scientist), medical specialists (surgeons, ophthalmologists, orthopedic, neurologists, psychiatrists, etc), nurses (public health nurses, nurse practitioners, clinical nurse specialists, midwives, nurse anesthetists), pharmacists, technologists and technicians (laboratory, radiology and pharmacy), social workers, and therapists (speech, physical, and occupational therapists). *Information Systems* - A health information system (HIS) refers to a system designed to manage healthcare data, to include systems that collect, store, manage and transmit the electronic health record (EHR). The HIS can be used to schedule patient appointments, transmit medication and laboratory tests information, refill prescriptions, and more. Lastly, information systems are used in clinical decision support to analyze data from various clinical and administrative systems, to assist care providers in rendering clinical decisions and in making trending prognostications (Reid et al., 2005).

SVHSM Sectors.

Forming the nexus of this author-designed virtual healthcare system model are six sectors comprising the interconnectivity of the system. Demonstrating how these factors interface and impact the system overall are: the tertiary care sector, community-based sector, business management sector, health systems engineering sector, population-based health sector and regulatory and political sector. *Tertiary Care Sector* – Systems needed to manage the departments of pharmacy, clinical labs, nuclear medicine, dietary, housekeeping and cybersecurity. *Community-Based Care Sector* –

Systems needed to manage a home health agency, rehabilitation center, outpatient clinic, long-term care facility and telehealth networks. B*usiness Management Sector* – Systems needed for third party reimbursement and other revenue generating mechanisms, which are utilized to execute a cost benefit analysis. *Health Systems Engineering Sector* – Systems-engineering tools needed to improve quality and productivity using financial engineering, risk analyses, supply chain management and wireless interfaces and devices. *Population-based Health Sector* – Systems needed for public health professionals to lead the team in data analytics, epidemiology, surveillance measures and disaster preparedness. *Regulatory and Political Sector* – Systems needed for public and private insurers, and reimbursement systems (value-based care, hospital readmission reduction program, accountable care organizations, medical/health home model, nurse managed health centers), which regulate the revenue generation for the health services rendered. With this Model the student learner is helped to understand that these mechanisms are heavily controlled by regulatory and accrediting policy, statutes and laws. Each student team was given challenging case studies, for which group developed plans of action were submitted, factoring in the interplay among the six sectors of the simulated healthcare system. To implement the plan, students understood that collaboration is needed among the six constructs of the Model in order to effect positive healthcare outcomes.

Simulation Seminar Series Course Content

Students enrolled in eight healthcare disciplines, including nursing, were given the opportunity to satisfy course requirements for community health, internship or capstone courses by participating in the SVHSM seminar series. This simulation-based experience was designed to develop expertise in the students' ability to work in interprofessional community-based settings (Humbles et al., 2017). The objectives of the simulation were both summative and formative, permitting students to practice and demonstrate proficiency in the management of complex community-based situations (disaster preparedness and urban underserved community issues); and, in the utilization of team-based skills using the TeamSTEPPS model including communication, mutual support, leadership, and situation monitoring (Guidelines, 2021). The eight-week seminar series consisted of three phases which offered the didactic, simulation and clinical components of the learning experience as described below.

Phase 1 Didactic Component.

During the didactic phase of the 8-week seminar series community-based class assignments included: the submission of a grant proposal to address an identified community health need, using cost benefit analyses to document the cost effectiveness of the proposed project; the development of a public policy brief to enhance awareness of the proposed project and to promote advocacy activities; the use of county health rankings to describe the demographics of a targeted community; the completion of a virtual windshield survey using Google Earth technology to identify community resources; the completion of a 4-hour online webinar on motivational interviewing techniques at the end of which students receive a continuing education certificate, verifying that they have learned how to assess readiness to change negative behavior in selected patients; and, the creation of a professional poster for presentation at a scholarly forum.

To ensure that the SVHSM seminar series satisfied the program learning outcomes for the participating nursing and health professions curricula of study, a crosswalk was developed demonstrating the alignment between the curriculum, instruction, and simulation activities associated with an interprofessional team-based education approach to addressing population health issues. Students met via zoom for 3-hour online synchronous weekly sessions to explore content and engage in team building activities. Additionally, it was the expectation that students would spend 4 hours each week in preparing the grant proposal and interacting with their assigned team members (32 hours); approximately 8 hours a week working on required research necessary to complete the virtual assignments (64 hours); approximately 4 hours in writing and working on specific course assignments; and 3 hours per week in the synchronous weekly sessions (24 hours) over the 8-week term.

Phase 2 Simulation Component.

The design of Phase 2 facilitated collaboration and interprofessional team training in community-based settings, using virtual/augmented reality modalities. A gamified virtual reality platform was used to engage interprofessional students in population health activities within a simulated virtual healthcare system (Carlson & Gannon, 2016; Horsley et al., 2018). Simulation included the use of role playing, and computer-based critical thinking activities to include augmented, virtual and mixed reality technologies. Throughout the SBE training experience at National University, students engaged in simulation activities based on the standards established by the *NCSBN Simulation Guidelines for Prelicensure Nursing Education Programs*, the International Nursing Association for Clinical Simulation and Learning (INACSL) Standards of Best Practice, and the Society for Simulation in Healthcare (SSH). With the assistance of zoom technology, students assumed the role of avatars to virtually walk through a simulated underserved neighborhood interfacing with simulated residents and businesses. Similarly, in a simulated bus-train accident, where time is of the essence, students used interventional strategies to call in appropriate federal and local agencies to assist in the onsite management of care, and the transport of simulated victims to healthcare facilities. At the community level, students accessed the Lippincott *Clinical Experiences: Community, Public, and Population Health Nursing* e-modules, which offered clinical experiences that consistently expose students to diverse settings, situations, and populations. Students were exposed to the real-life application of key community, public, and population health concepts. In this virtual environment students made observations, held virtual conversations, triaged at a disaster scene, and conducted research online. Additional real world clinical assignments served to supplement or replace clinical activities or practica. Students were able to view community health from the perspective of public health and population health issues. These simulated experiences afforded students the opportunity to experience the breadth of community health nursing (Tiffany & Hoglund, 2018).

Phase 3 Clinical Component.

Figure 2 depicts the interprofessional population health educational model demonstrating the inter-relationship of the three academic departments, which house the health curricula of study. Interprofessional student teams, supervised by faculty, collaborated in the development of healthcare strategies to address issues presented in the simulated scenarios. The health informatics student assisted with the collection of medical record data and coding information. The public health students were assigned to gather demographic data, complete community assessments, and design population based interventional strategies to address healthcare needs. The healthcare administration students implemented managerial projects; the data analytic students collected and analyzed clinical and epidemiological data findings; the allied health students conducted cost benefit analyses; the clinical laboratory science students proposed the use of point-of-care laboratory technologies; and, the nursing students performed health assessments, developed plans of care, provided patient education, implemented disease management protocol, and participated as members of care coordination and transition teams.

Method

Study Design

Research approval to conduct this study was obtained in advance from the National University Institutional Review Board. This descriptive study measured a convenience sample of 229 students representing 10 cohorts, who at the end of the 8-week simulation seminar series responded to an online survey consisting of 14 questions.

Instrument

The survey evaluation tool consisted of a set of 14 questions, developed by the lead author, which measured four constructs: level of satisfaction with course content (7 questions), level of experience engaged in teamwork (5 questions), extent of faculty accessibility (1 question), and probability of recommending the experience to peers (1 question). Survey items were determined to have face validity based on an assessment made by the scientific experts co-authoring this study, who evaluated the extent to which the items appeared to be reasonable

measures of the underlying constructs. The instrument used a 5-point Likert scale to measures all responses, where a score of 5 represented the highest level of agreement.

Research Questions

1. To what extent will students rate their level of satisfaction with content taught in a simulated setting?
2. To what extent will students rate their level of experience engaged in interprofessional teamwork?
3. To what extent will students rate their probability of recommending this experience to peers?
4. To what extent will students rate faculty accessibility in meeting learning needs?

Sample

A total of 229 students participated in the SVHSM Project, with cohort sizes ranging from 9 to 52 students engaged in the 8-week simulation experience. As Table 1 indicates a majority of the participants were female, with a significant variance in the ethnicity of the student participants. The study sample was 29% male, 71% female, 32% White, 15% Black, 24% Hispanic, 22% Asian and 6% Bi-racial. As depicted in Table 2, the 229 total student participants represented eight different disciplines: nursing undergraduate and graduate (46%), informatics (1%), allied health (6%), public health (13%), data analytics (3%), healthcare administration undergraduate and graduate (27%), integrative health (0.7%), and clinical laboratory science (4%).

Findings

Level of Satisfaction.

In response to seven questions using a Likert scale ranging from 1 being very dissatisfied to 5 being extremely satisfied, the weighted average scores were computed to measure student responses to the level of satisfaction. As displayed in Table 3 the weighted average scores ranged from 4.24 to 4.43, with a majority of the respondents rating their experience as extremely satisfied.

Level of Team Engagement.

In response to five questions using a Likert scale ranging from 1 being very poor experience to 5 being a great experience, the weighted average scores were computed to measure student responses to team participation and group projects. As displayed in Table 4 the weighted average scores ranged from 4.17 to 4.45, with a majority of the respondents rating the teamwork experience as great.

Faculty Accessibility and Probability of Recommendation.

In response to one question each, a majority of the respondents rated the accessibility of faculty (weighted average score = 4.55), and the probability of recommending this learning experience to their peers (weighted average score = 4.27) at the higher end of the Likert scale.

Importance

The importance of these findings suggest that the utilization of simulation technology can enhance the development of teamness, in designing opportunities for nursing students to engage in interprofessional education (IPE) learning experiences. The most recent revisions to the American Association of Colleges of Nursing new directions for nursing education now include among its *Essentials* publication, Domain 6: Interprofessional Partnerships (AACN, 2021). The Contextual Statement defining this domain concludes that "…Interprofessional partnerships require a coordinated, integrated, and collaborative implementation of the unique knowledge, beliefs, and skills of the full team for the end purpose of optimized care delivery" (p.42).

Study Limitations

This study had several limitations worth noting. First, the study respondents were selected from a convenience sample of students who participated in the simulation seminar series. The generalizability of the findings is limited to the sample of the interprofessional students enrolled in programs of study at one university. Further, the descriptive study methodological approach that was utilized to measure study findings limits the ability to make inferential causal statements about the relationships among the study variables.

Implications for Practice

According to studies conducted by the national State Boards of Nursing, simulation can be substituted for up to 50% of clinical experience (Alexander, et al., 2015). More nursing research needs to be conducted to measure the effectiveness of

immersive simulation experiences for nursing students. Additionally, further research is needed on the effectiveness of IPE learning opportunities to better preare beginning nurses for practice as members of interdisciplinary teams. Lastly, as the field of simulation and extended reality (XR) technologies increasingly become the modes of instruction in higher education, schools of nursing need to ensure that faculty training in the use of these technologies becomes a standard of practice.

Conclusions

This Project innovatively utilized virtual and augmented reality clinical experiences, that immersed teams of interprofessional students into simulated environments designed to better prepare nursing students to engage in teamwork activities, in formulating an enhanced understanding of the real world setting of underserved communities. The purpose of this project was to prepare nursing students to engage in IPE teamwork activities using a simulated model of the current healthcare system, with a focus on addressing the needs of the underserved. Borrowing from the field of aviation in its use of resource management techniques to improve communication, team coordination, and navigation around sudden inclement conditions and equipment failures, the SVHSM Project was designed to create realistic and challenging scenarios that stimulate critical thinking and effective team performance. The disarray of the current healthcare delivery system was made clearly evident as this nation grappled with the challenges caused by the COVID-19 pandemic. A better understanding of the healthcare delivery system through the use of virtual reality clinical scenarios can help to guide the student in learning how to manage unforeseen outbreaks, natural disasters, and the care delivery in underserved community settings as members of interprofessional healthcare teams.

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Figure 1: The Simulated Virtual Healthcare System Model

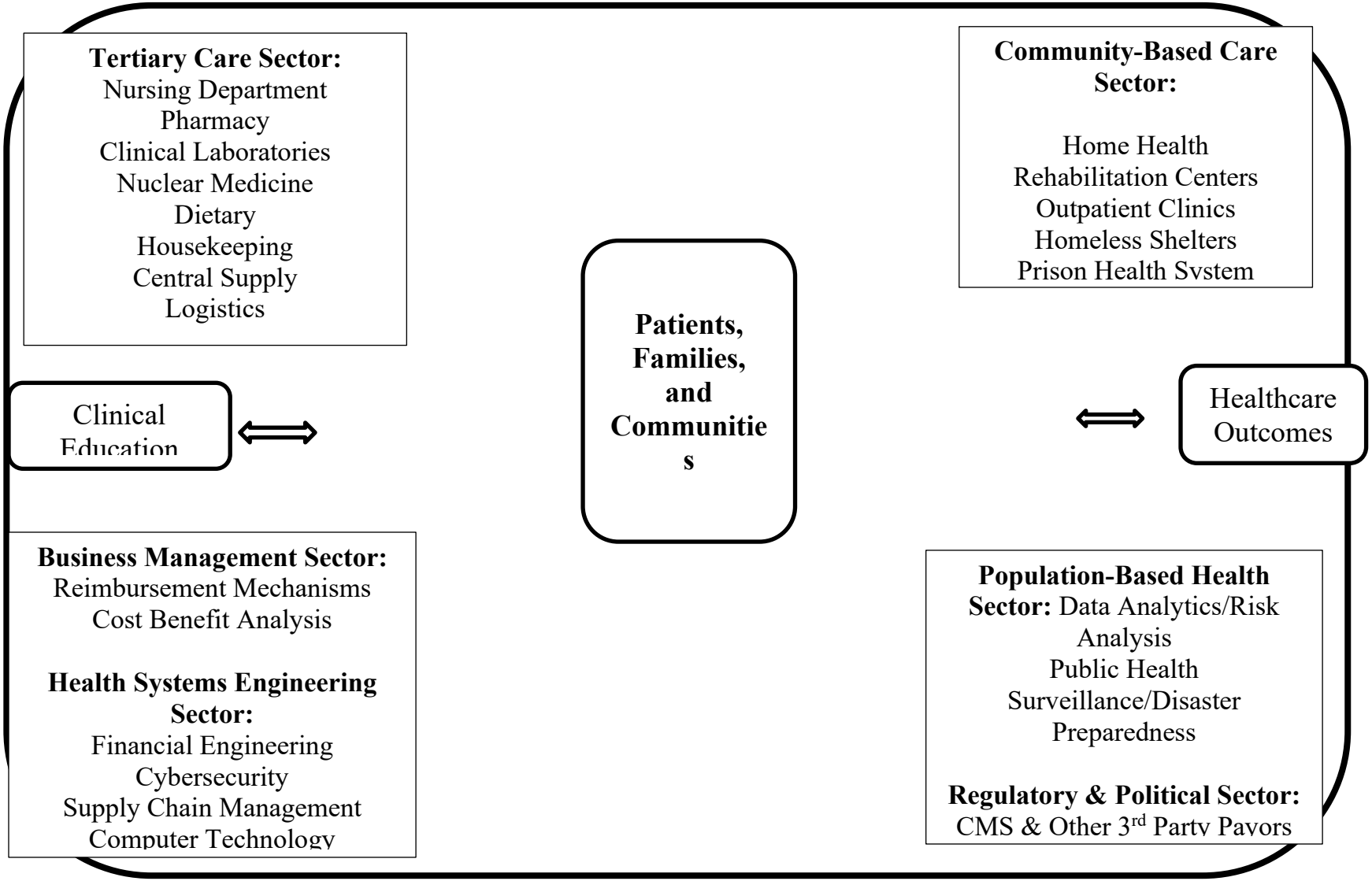

Figure 2
SVHSM Interprofessional Education Project

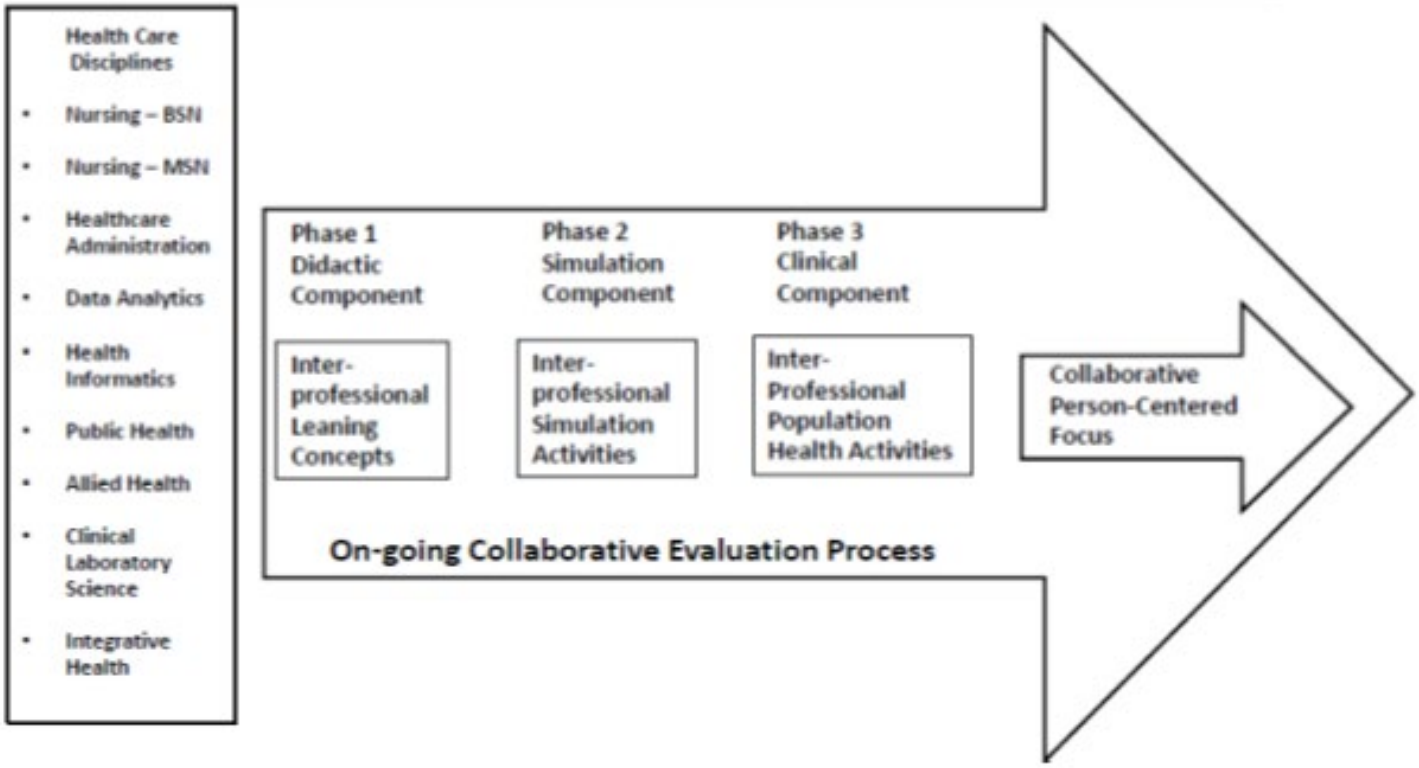

Table 1: Simulation Seminar Series Participants by Gender and Ethnicity

Cohort	Totals	Males	Female	White	Black	Hispanic	Asian	Bi-racial
1	14	4	10	6	2	2	4	0
2	26	7	19	5	4	7	7	3
3	10	3	7	2	1	3	2	2
4	20	6	14	6	4	9	1	0
5	21	8	13	4	4	5	8	0
6	24	10	14	7	7	4	6	0
7	13	5	8	5	2	1	4	1
8	9	1	8	3	1	1	3	1
9	40	11	29	14	2	11	10	3
10	52	12	40	22	8	12	6	4
Totals	**229**	**67**	**162**	**74**	**35**	**55**	**51**	**14**
Percent	100%	29%	71%	32%	15%	24%	22%	6%

Table 2 Legend

AH: Allied Health

BSN: Bachelor of Science in Nursing

MPH: Master's in Public Health

HCA: Healthcare Administration

MHA: Master's in Healthcare Administration

MSN: Master's in Nursing

CLS: Clinical Laboratory Science

Data: Data Analytics

Inf: Health Informatics

Table 2: Simulation Seminar Series Participants by Discipline

Cohort	AH	BSN	MPH	HCA	MHA	MSN	CLS	Data	Inf	Int	Totals
1	3	0	2	1	0	0	3	4	0	1	14
2	0	4	8	10	0	0	3	0	1	0	26
3	0	0	0	10	0	0	0	0	0	0	10
4	4	6	3	5	0	0	2	0	0	0	20
5	2	0	11	8	0	0	0	0	0	0	21
6	1	6	3	10	0	0	0	3	1	0	24
7	3	0	0	2	0	7	1	0	0	0	13
8	0	0	1	8	0	0	0	0	0	0	9
9	0	37	1	2	0	0	0	0	0	0	40
10	0	37	0	1	4	10	0	0	0	0	52
Totals	**13**	**90**	**29**	**57**	**4**	**17**	**9**	**7**	**2**	**1**	**229**
Percent	6%	39%	13%	25%	2%	7%	4%	3%	1%	0%	100%

Table 3: Weighted Average Scores of Student Responses to Level of Satisfaction with Content Taught[1]

Satisfaction	very Dissatisfied	somewhat dissatisfied	somewhat satisfied	very satisfied	extremely satisfied	number of students	**weighted average**
Likert Scale	**1**	**2**	**3**	**4**	**5**		
How satisfied were you with the discussions on Team Roles and Functions and related interactive activities	2(1%)	7(3%)	23(10%)	70(31%)	121(54%)	223(100%)	**4.35**
How satisfied were you with the discussions on Cost and Experience of Care and related interactive activities	2(1%)	11(5%)	31(14%)	67(30%)	112(50%)	223(100%)	**4.24**
How satisfied were you with the discussions on Population Health and related interactive activities	1(1%)	7(3%)	22(10%)	60(27%)	132(59%)	222(100%)	**4.42**
How satisfied were you with the discussions on Community Engagement and related interactive activities	2(1%)	7(3%)	20(9%)	60(27%)	134(60%)	223(100%)	**4.42**
How satisfied were you with the discussions on Culture/Ethnic/Gender Diversity and related interactive activities	4(2%)	7(3%)	19(9%)	52(23%)	141(63%)	223(100%)	**4.43**
How satisfied were you with the discussions on SBIRT/IMPACT Model and related interactive activities	3(1%)	5(2%)	20(9%)	62(28%)	133(60%)	223(100%)	**4.42**
Overall how satisfied were you with your experience as a SVHSM Intern	8(4%)	5(2%)	19(9%)	50(23%)	140(63%)	222(100%)	**4.39**

Table 6: Recommendation Rating[2]

Recommendation	not at all likely	not so likely	somewhat likely	very likely	extremely likely	number of students	**weighted Average**
Likert Scale	**1**	**2**	**3**	**4**	**5**		
How likely would you be to recommend the SVHSM Seminar Series to other students	10(4%)	7(3%)	29(13%)	44(20%)	133(60%)	223(100%)	**4.27**

[1] Percentages may not total 100 due to rounding and skipped responses

[2] Percentages may not total 100 due to rounding and skipped responses

Table 4: Weighted Average Scores for Student Responses to Teamwork and Group Projects[3]

Experience	very poor experience	poor experience	so-so experience	good experience	great experience	number of students	**weighted average**
Likert Scale	**1**	**2**	**3**	**4**	**5**		
How would you rate your experience with working as members of an interprofessional team	4(2%)	6(3%)	19(9%)	50(22%)	144(65%)	223(100%)	**4.45**
How would you rate your experience with developing a grant proposal	2(1%)	9(4%)	24(11%)	55(25%)	133(60%)	223(100%)	**4.38**
How would you rate your experience with developing a cost benefit analysis and poster	4(2%)	11(5%)	30(13%)	75(34%)	103(46%)	223(100%)	**4.17**
How would you rate the format of the synchronous class sessions	4(2%)	11(5%)	9(4%)	61(27%)	138(62%)	223(100%)	**4.43**
How would you rate the offline experience working in teams	5(2%)	8(4%)	17(8%)	56(25%)	135(61%)	221(100%)	**4.39**

Table 5: Faculty Accessibility Rating[4]

Accessibility	Not at all accessible	Not easily accessible	Somewhat accessible	Very accessible	Extremely accessible	number of students	**weighted Average**
Likert Scale	**1**	**2**	**3**	**4**	**5**		
How accessible were the faculty who participated in the SVHSM Seminar Series	0(0%)	1(0%)	20(9%)	56(26%)	142(65%)	219	**4.55**

[3] Percentages may not equal 100 due to rounding and skipped responses
[4] Percentages may not equal 100 due to rounding and skipped responses

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Reducing First-Year Nursing Students' Perceived Stress Levels Using Mindfulness Meditation

Abstract

Stress may directly, or indirectly, hinder the learning and academic performance of undergraduate nursing students during their nursing education program. Nursing students must be equipped with effective coping strategies to manage stressors thereby supporting their learning and reducing the impact of stress on their health and retention in the nursing program. This paper utilized a quantitative, quasi-experimental, one-group pretest-posttest design to evaluate the effectiveness of mindfulness meditation as a stress reduction intervention on the perceived stress levels of 20 first-year undergraduate nursing students, after six weeks of implementing the intervention. Results indicated that six weeks of mindfulness meditation were effective in reducing the perceived stress levels of participants. The magnitude of the difference between the pretest and posttest stress scores was significant.

Keywords: Stress, nursing students, mindfulness meditation, perceived stress

Background

Stress results from the interaction between an individual with their environmental factors, in which the individual perceives the stressor as a threatening situation that exceeds their ability to cope (Mussi et al., 2020). Experiencing minimal levels of stress in nursing students may promote motivation, learning, and performance (Onieva-Zafra et al., 2020). However, high levels of stress could have negative consequences leading to poor mental and physical health, inhibiting learning, and may result in withdrawal from their nursing program (Labrague, 2021). Withdrawals and high attrition rates of nursing students from nursing programs contribute to the existing nursing workforce shortage (Barbé et al., 2018; Eudy & Brooks, 2022). The inability of nursing students to cope effectively with stressful situations can harm their mental, emotional, and physical well-being. It can result in burnout, sleeping difficulties, depression, suicidal thoughts (Zheng & Hao, 2022; El-Ashry et al., 2022), and utilization of maladaptive coping strategies such as alcohol abuse and self-harm (Charlton & Wofford, 2022)

It is evident from studies that undergraduate nursing students experience moderate to high levels of stress during their nursing education compared to other majors (Lavoie-Tremblay et al., 2021). However, there needs to be more research on the stress levels of first-year undergraduate nursing students. According to Mussi et al. (2020), first-year undergraduate students experience a higher stress level due to academic and clinical activities. Lavoie-Tremblay et al. (2021) study on the sources of stress and coping strategies among undergraduate nursing students across all years indicated that stress impacted the well-being of first-year nursing students negatively due to difficulty balancing personal demands and academic demands and difficulty adjusting to college life. Sources of participants' stress reported in this study include course workload, assignments, examinations, and pressure to achieve a passing grade (Lavoie-Tremblay et al., 2021).

Several detrimental effects have been associated with high-stress levels among nursing students. Consequences of stress include poor physical and mental health and emotional, attitude, and behavioral problems (Hwang & Kim, 2022). Chaabane et al. (2021) reported that stress among nursing students could impact their academic and clinical success and their ability to work efficiently in the future. They also reported that stress causes severe mental health disorders such as anxiety and depression among nursing students. Stress may lead to substance abuse and a lack of empathy. It causes sleep cycle quality and quantity disturbances, as well as anxiety, which may result in academic failure and withdrawal from the nursing program (Zheng & Hao, 2022). Although there are varying sources of stress experienced by undergraduate nursing students, the most reported sources

of stress are academic and clinical stressors (Majrashi et al., 2021). Academic-related stressors include course load, exams, assignments, low grades, and lack of breaks (Chaabane et al., 2021). Clinical-related stressors include heavy assignments and workload, a lack of knowledge and skills, fear of making mistakes, and caring for patients (Liu et al., 2022)

Since the experience of stress during first-year nursing education is inevitable, the utilization of effective coping strategies by nursing students is warranted to decrease perceived stress levels and improve academic performance (Onieva-Zafra et al., 2020). Mindfulness is an awareness that occurs due to paying attention to the present moment (Schuman-Olivier et al., 2020), and meditation is a practice that involves calming the mind and increasing awareness of the mind and our environment (Behan, 2020). Mindfulness meditation pays attention to the present moment nonjudgmentally (Schuman-Olivier et al., 2020). It is a mental training practice that involves intentionally calming the mind to empty it and ultimately achieve inner peace or harmony (Wiguna et al., 2018). Studies have shown that mindfulness enriches the lives of those who practice it frequently. It improves well-being, mood, overall health, and sleep quality (Rush et al., 2019). It is helpful in the management of anxiety and depression and improves overall well-being in health care providers through stress reduction (McVeigh et al., 2021). Mindfulness meditation has decreased stress and anxiety in healthcare providers and nursing students (Koren, 2017).

Therefore, the purpose of this study is to evaluate mindfulness meditation's effectiveness as a stress reduction intervention on the perceived stress levels of first-year undergraduate nursing students after six weeks of implementing the intervention.

Research Hypothesis

*H*1. Mindfulness meditation will reduce the perceived stress levels of first-year undergraduate nursing students.

Null Hypothesis

*H*0. Mindfulness meditation will not reduce the perceived stress levels of first-year undergraduate nursing students.

Methods

A quantitative, quasi-experimental (one-group pretest-posttest research design) design was utilized for this study. The study assessed the effectiveness of mindfulness meditation as a stress reduction intervention on the perceived stress levels of undergraduate nursing students. Participants completed the Perceived Stress Scale-10 (PSS-10) pretest before implementing mindfulness meditation, and the PSS-10 post-test was completed six weeks after the implementation of mindfulness meditation .

Setting and Participants

The setting utilized for this study was a university in Southwest Georgia nursing department. The study population comprised 20 Associate of Science in Nursing degree students in their first year. Nonprobability sampling, using the purposive sampling method, was used to obtain participants for this study. Participants were informed of the study via WebEx meetings and emails. Inclusion criteria for participation in the study were Associate of Science in Nursing degree students that are not registered nurses, 18 years or older, enrolled in the fundamentals of nursing course, and able to read and write in English. The exclusion criteria for this study included nursing students that were already registered nurses, less than 18 years of age, were not enrolled in the fundamentals of nursing course and that are unable to read and write in English.

Perceived Stress Scale (PSS-10)

PSS-10, formulated by Cohen et al. (1983), was utilized to assess nursing students' perceived stress levels. The PSS-10 measures the extent to which situations in one's life are considered stressful (Maroufizadeh et al., 2018). Cohen and Janicki-Deverts (2012) conducted a study about the distributions of psychological stress in the United States using probability samples. The study, which involved administering three national surveys in 1983, 2006, and 2009 utilized PSS-10 to measure psychological stress. The study established the validity of PSS-10. The reliabilities (Cronbach's alpha) for the PSS-10 were 0.78 and 0.91 in both the 2006 and 2009 samples. Several research authors have also documented the reliability and validity of the PSS using Cronbach's alpha coefficients for assessing internal consistency.

Six items of the PSS-10 measure stress, and four measure coping strategies. A five-point Likert-type scale was utilized in rating nursing students' perceived stress. Each item on the scale is scored from 0 (never) to 5 (very often) with a range of 0 to 40 for the total score of the scale (0 = Never, 1 = Almost Never, 2 = Sometimes, 3 = Fairly Often, 4 = Very Often). Positively worded items (items 4, 5, 7, and 8) are reverse-scored. Higher scores on the scale indicate a higher stress level (Manzar et al., 2019). All 20 participants completed the PSS pretest before implementing the mindfulness meditation and the PSS post-test six weeks after implementing the stress-reducing intervention.

Mindfulness Meditation

The PI was granted permission to utilize the mindfulness meditation videos produced by the Honest Guys for this study. Participants completed the demographic questionnaire and PSS-10 (pre-test) before implementing mindfulness meditation. The PI presented the mindfulness meditation videos to participants once every week via WebEx, and links for the videos were also emailed to participants. Emails were sent to participants every week to remind them to join the WebEx meeting at the time scheduled for the mindfulness meditation video presentation. Participants were required to watch different YouTube mindfulness meditation videos every week. After six weeks of implementing mindfulness meditation, the PSS-10 (Post-test) was re-administered and completed by participants.

Data Collection and Analysis

Data were collected anonymously using self-completed questionnaires. Demographic data and PSS-10 (pretest) data were collected online via a survey before implementing mindfulness meditation. PSS-10 (post-test) data were collected online via a survey six weeks after implementing the mindfulness meditation intervention. Descriptive and inferential analysis of data obtained from this study were conducted using Microsoft Excel and IBM SPSS 20.0, respectively. Descriptive statistics were used to describe study participants in age, gender, marital status, employment status, race/ethnicity, and perceived stress levels. Inferential statistics was used to test the hypothesis of this study. Paired sample *t*-test was used to assess differences between the results of the PSS-10 collected in the two different periods (before and after the implementation of the stress reduction intervention). The Chi-square test of independence was used to assess the association of various demographics, such as gender and employment status, with perceived stress levels.

Ethical Consideration

A detailed proposal outlining all study methods, delivered via PowerPoint, was submitted to the university's institutional review board, where the study was conducted, and permission was granted for the investigation. Principal investigator (PI) informed participants about the purpose of the study, potential risks and benefits, consent document, and how their privacy and confidentiality will be protected. Participants received a copy of the informed consent via email. Participants consented to participate in the study by signing the informed consent form.

Results

Demographics

Twenty students participated in the study. Average age of participants was 35 years. Participants were comprised of 10% male and 90% female students. There was diversity in race/ethnicity of participants as follows: 25% were White, 70% were Black or African American, and 5% were Hispanic or Latino. According to data obtained about participants' marital status, 35% were single/never married, 55% were married, 5% had a significant other, and 5% were divorced. There were 80% employed and 20% unemployed participants.

Nursing students' stress was measured using the Perceived Stress Scale-10 (PSS-10). Table 2 indicated that majority of the students reported that sometime during the last month, they were upset because of something that happened unexpectedly (60%), and sometimes and very often, they were unable to control important things in life (30%), felt nervous or stressed very often (45%), sometimes could not cope with all the things they had to do (55%), angered because of things that were outside of their control (40%), and felt that difficulties were piling up so high that they could not overcome them (25%). Furthermore, it was found that students reported that sometime during the last month, they were confident about their ability to handle personal problems (65%), sometimes felt that things were going their way (60%), control irritations in their life (65%), and were on top of things (40%).

PSS-10 pretest score indicated that out of 20 associate degree nursing students, 3 (15%) of them had low-stress levels, 12 (60%) were moderately stressed, and 5 (25%) had high-stress levels. PSS-10 post-test score, after implementation of mindfulness meditation intervention for six weeks, indicated that 17 (85%) of participants had low-stress levels, 3 (15%) were moderately stressed, and no participant experienced high-stress levels. PSS-10 scores were obtained by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1, and 4 = 0) to the four positively stated items (items 4, 5, 7, and 8) and then summing across all scale items.

Inferential statistics results are shown on Table 3. It was conducted to test the hypothesis of this study. A paired sample *t*-test was calculated to evaluate the effect of mindfulness meditation on the perceived stress scores of participants. The result showed that there was a statistically significant difference between pretest scores ($M = 22.75$, $SD = 6.32$) and post-test perceived stress scores ($M = 10.70$, $SD = 3.93$); $t(19) = 7.914$, $p < .001$. Hence the stated null hypothesis (H_0) was rejected. The observed effect size statistics (d) for the paired sample *t*-test was calculated as 2.29.

Discussion

Effect of mindfulness meditation on first-year undergraduate nursing students' perceived stress levels

was examined in this study. Undergraduate nursing students experience stress from academic and clinical workload, academic failure concerns, finances, lack of support during clinical rotation, and the care of patients. Transitioning to college life and meeting academic demands are sources of stress for first-year undergraduate nursing students. The impact of stress may lead to burnout and withdrawal from nursing programs (McVeigh et al., 2021). Findings of this study indicated that first-year undergraduate nursing students experience moderate to high levels of stress during their nursing education.

Similar findings were reported by Mahfouz and Alsahli (2016) in a study that utilized the Perceived Stress Scale-14 (PSS-14) to assess the perceived stress and coping strategies among 51 nursing students. Data from the study of Mahfouz and Alsahli (2016) revealed that participants experienced moderate to high-stress levels. This result is consistent with the outcome of the study by Onieva-Zafra et al. (2020). This study utilized the PSS to assess anxiety, perceived stress, and coping strategies in 190 nursing students. The study showed that approximately half of the students indicated a moderate stress level, and the senior nursing students had a higher perceived stress level than others. Chaabane et al. (2021) systematically reviewed the literature on the perceived stress, stressors, and coping strategies among nursing students in the Middle East and North Africa and also reported the existence of moderate to high levels of stress among nursing students.

Mindfulness meditation is an intervention proven to reduce stress and anxiety. The outcome of this study demonstrated that six weeks of mindfulness meditation was effective at reducing the perceived stress levels of nursing students. The post-test mean score and standard deviation were lower after the mindfulness meditation intervention than the pretest mean score and standard deviation. Paired sample *t*-test showed a statistically significant reduction in perceived stress levels of participants after the six weeks of mindfulness meditation intervention. The observed effect size was large. This effect size indicates that the magnitude of the difference between the pretest and post-test stress scores was significant.

This result is consistent with the outcome of the study that was conducted by Ratanasiripong et al. (2015) examining the efficacy of two mindfulness meditation interventions on anxiety and perceived stress levels in second-year nursing students. The study suggests that mindfulness meditation significantly reduced participants' anxiety and perceived stress levels from preintervention to postintervention. Similarly, the post-test stress level mean score was significantly lower than the pretest stress level mean score after implementing mindfulness meditation, in a study conducted by Suganya et al. (2018). The study by Dai et al. (2022) that assessed the efficacy of a mindfulness-based online intervention on the mental health of 120 undergraduate nursing students during the coronavirus pandemic showed a significant reduction in their anxiety and stress symptoms.

Limitations

Limitations related to this study included the small sample size. Another limitation was that the study was conducted in a single university in Southwest Georgia; therefore, findings may not be generalized to all nursing students at all universities. Also, implementing mindfulness meditation via WebEx and emailed links to the videos decreased the supervision of the study. Furthermore, fewer male than female nursing students were involved in the study due to the limited number of male students enrolled in nursing programs. In addition, time constraints for the intervention implementation were a limitation of this study, but this was reduced by sending the mindfulness meditation videos links to participants.

Implications for Evidence-based Practice and Research

Implications for Practice

There are implications for nursing practice in research and as a result of this study. It was evident that undergraduate nursing students experience a significant amount of stress during their nursing education. Frequent exposure of nursing students to high levels of stress and their inability to cope with stressors can impair their academic success and increase their susceptibility to various health problems. Stress often results in poor academic performance and withdrawal from nursing programs. Brook et al. (2021) reported a strong relationship between stress and attrition of undergraduate nursing students. Because of stress, the attrition of undergraduate nursing students from nursing programs significantly impacts the nursing workforce (Chan et al., 2019; Kubec, 2017; Smith & Yang, 2017).

The nursing workforce, the largest segment of healthcare professionals in the United States, is currently experiencing a severe shortage. According to the American Association of Colleges of Nursing (2022), a shortage of Registered Nurses is expected to increase in the U.S. and spread across the country through 2030 as baby boomers age and the need for health care grows.

Implications for Nursing Education

Nursing students frequently experience various stress factors that could hinder their success, directly or indirectly. These stressors may adversely affect undergraduate nursing students' learning ability, self-

efficacy, self-esteem, persistence, and success. Stressors may also cause emotional and behavioral symptoms in nursing students (Hwang & Kim, 2022). Low to moderate stress levels may increase academic performance, but high-stress levels often result in academic failure and withdrawal from nursing programs. According to Manocchi (2017), high-stress levels impair attention, affect the ability to concentrate, decrease retention of learned materials, and increase academic failure. Stress is one of the contributors to nursing students' attrition (Smith & Yang, 2017). Students' ability to cope with stressors is crucial to their retention in nursing education programs.

Undergraduate nursing students are the future of the nursing workforce; however, the low yearly graduation rate of nursing students might be insufficient to meet the demands for nursing services in the United States (Cogburn et al., 2015). Harris et al. (2014) stated that despite the need for more nurses, graduating adequate numbers of competent nurses to meet healthcare demands has been a major challenge. According to these authors, attrition of nursing students is an obstacle to alleviating the nursing workforce shortage. Eudy and Brooks (2022) stated that decreasing attrition rates and moving new nurses into the workforce could help improve the nursing shortage. It is, therefore, expedient to implement interventions to alleviate stress and increase nursing students' retention and success.

Recommendations for Research

Recommendations for future research include longitudinal studies to track the beneficial effects and outcomes of mindfulness meditation interventions incorporated into the undergraduate nursing curriculum. A future study with a larger sample size that includes both the experimental and control groups is also recommended. In addition, including a qualitative design, increasing the sample size, including more male students and different types of nursing programs to participate in future studies may provide a valuable understanding of the experience of stress during nursing education.

Conclusion

Stress is a global problem among undergraduate nursing students. It is well documented that undergraduate nursing students experience considerable stress during their nursing training, which warrants the implementation of stress reduction interventions. This study contributes to the knowledge that mindfulness meditation is an effective intervention for reducing stress. Without adequate coping strategies, nursing students have resorted to negative coping strategies such as alcohol abuse and self-harm (Charlton & Wofford, 2022).

Reducing undergraduate nursing students' stress is crucial to their health and well-being and essential to their progression and retention in nursing programs. As the demand for nursing services continues to increase in the United States, it becomes imperative for nursing education administrators and educators to support undergraduate nursing students with coping strategies that can enhance their academic success. Alleviating undergraduate nursing students' stress levels can be achieved by ensuring that stress-reduction interventions are incorporated into the undergraduate nursing curriculum (Ratanasiripong et al., 2015; Williams, 2014).

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Table 1

Summary of Demographic Data

Category	Frequency	Percentage (%)
Age Group		
18- 24	3	15
25- 34	5	25
35- 44	10	50
45 and older	2	10
Gender		
Male	2	10
Female	18	90
Others	-	-
Race/Ethnicity		
White	5	25
Hispanic or Latino	1	5
Black or African American	14	70
Asian	-	-
American Indian/Alaskan	-	-
Other	-	-
Marital Status		
Single/Never Married	7	35
Married	11	55
Domestic/Significant Other	1	5
Divorced	1	5
Employment Status		
Employed	16	80
Not Employed	4	20

Note. The dash sign in the table signifies that data was not reported

Table 2

Participants Perceived Stress During the Last One Month

Item No.	Items		Never	Almost Never	Sometimes	Fairly Often	Very Often
1	In the last month, how often have you been upset because of something that happened unexpectedly?	No	0	1	12	5	2
		%	0	5	60	25	10
2	In the last month, how often have you felt that you were unable to control the important things in your life?	No	0	3	6	5	6
		%	0	15	30	25	30
3	In the last month, how often have you felt nervous and "stressed"?	No	0	0	4	7	9
		%	0	0	20	35	45
4	In the last month, how often have you felt confident about your ability to handle your personal problems?	No	0	0	13	4	3
		%	0	0	65	20	15
5	In the last month, how often have you felt that things were going your way?	No	1	3	12	2	2
		%	5	15	60	10	10
6	In the last month, how often have you found that you could not cope with all the things that you had to do?	No	2	1	11	5	1
		%	10	5	55	25	5
7	In the last month, how often have you been able to control irritations in your life?	No	0	2	13	4	1
		%	0	10	65	20	5
8	In the last month, how often have you felt that you were on top of things?	No	1	6	8	4	1
		%	5	30	40	20	5
9	In the last month, how often have you been angered because of things that were outside of your control?	No	0	3	8	5	4
		%	0	15	40	25	20
10	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	No	1	4	5	5	5
		%	5	20	25	25	25

Table 3

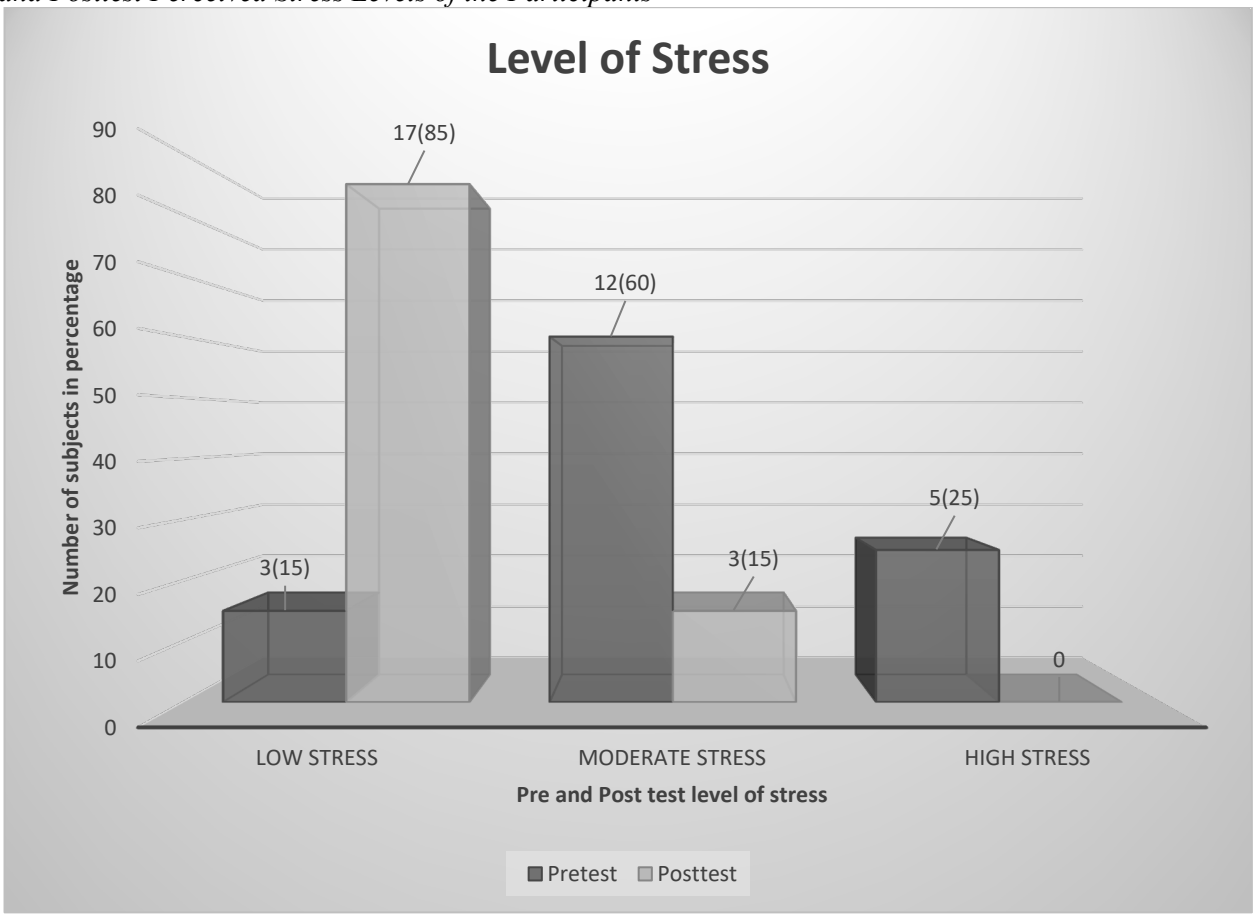
Paired Sample t-Test and Effect Size

Test	Observations	Mean	Standard deviation	SEM	Degree of freedom	Paired *t*-test	*p*-value	Effect size, *d*
Pretest	20	22.75	6.32	1.41	19	7.91	<.001	2.29
Posttest	20	10.70	3.93	.88				

Note: SEM- Standard Error of the Mean

Figure 1

Pretest and Posttest Perceived Stress Levels of the Participants



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Effects of Patient's Race on Pain Perception and Treatment in Nursing Students

Abstract

Previous research has investigated racial bias in the perception and treatment of patients' pain among healthcare providers and medical students, but not nursing students. Therefore, the aim of this study was to investigate whether a patient's race affects how nursing students perceive and treat patients' pain, for which an experimental research design was implemented. After completing the demographic questionnaire, 104 undergraduate and graduate nursing students were randomly assigned to either a Black or White patient condition, where they were presented with a clinical vignette and a picture detailing the pain of a 35-year-old Black or White man. The patient's race was not explicitly stated but rather revealed through an attached photograph, with each condition represented by one of eight unique photographs. Participants then used the Canadian Triage and Acuity Scale (Bullard et al., 2008) to evaluate the patient's pain level and triage wait time. Participants then reported how much of the patient's pain they attributed to medical or psychosocial factors, how much they trusted the patient's pain ratings, and if they believed he was drug-seeking using Chibnall et al. (2018) questionnaire. There were no significant differences between the Black or White patient conditions (all $|ts| < 1.41$, $ps > .16$), patient race effects or patient race x provider race interactions (all $ps > .1$). Results suggest future nursing providers do not exhibit racial biases in evaluations of chronic pain however, findings should be replicated for generalizability.

Keywords*: race, discrimination, healthcare, racial disparities, pain perception, racial bias*

Introduction

Race-related health disparities or preventable differences in opportunities to achieve optimal health are well documented in the literature, with many disparities in the health outcomes and quality of care in the United States being due to the undertreatment of patients (Chauhan, et al., 2020; Riley, 2012; Smedley et al., 2003; Williams, et al., 2019). Previous works suggest that racial disparities in pain management exist (Hampton et al., 2015), specifically in pain assessment and treatment. The physician's diagnosis and treatment of pain, which is the experience of physical discomfort or suffering caused by an illness or injury, can be influenced by patients' characteristics (e.g., race, gender, and age) (Marquié et al., 2003; Sampson, et al., 2019). For example, as evidenced by previous literature, in pain assessments of patients of color, providers are more likely to underestimate pain severity and treat it less aggressively in cases with severe or extreme pain for a variety of conditions (Anderson et al., 2009; Morales, et al., 2020; Todd et al., 1993; Todd et al., 2000). However, there is mixed evidence on whether patients' belonging to a specific racial/ethnic group affects the treatment of pain by healthcare providers (Aronowitz, et al., 2019; Breathett, et al., 2020; Butwick et al., 2016; Druckman et al., 2018; Samulowitz, et al., 2019; Schulman et al., 1999; Weisse et al., 2001; Tamayo-Sarver, 2003). There is currently research regarding the influence of patients' race on healthcare providers' clinical evaluation and treatment, and few studies on the effects of patients' racial background on pain perception and treatment in nursing students. This project aimed to investigate the question: how does a patient's race affect how nursing students perceive and treat patients' pain? As such, this project aimed to assess the presence of racial bias in pain perception and management among White and non-White nursing students in the southeastern United States.

Race and Ethnicity: Disparities in Healthcare

Race and ethnicity are both socially constructed categories that define groups of people (Obach, 1999).

The term race defines people based on their physical and biological attributes, while ethnicity classifies people based on their social and historical background (Edwards et al., 2001; Campbell & Edwards, 2012). Mathur et al. (2014) suggests that race and ethnicity hold a significant amount of weight in how a healthcare provider diagnoses and treats a patient. White Americans have benefitted from the systemic and structural racism in the healthcare field, as they are more likely to receive better quality care than people of color (Gee & Ford, 2011; Trawalter & Hoffman, 2015; Smedley et al., 2003). Conversely, Black Americans are known to be undertreated despite being more likely to suffer from certain illnesses (Anderson et al., 2009; Dore et al., 2014; Trawalter & Hoffman, 2015). Negative perception of Black American men, women, and children in healthcare settings could partly explain their shorter life expectancy and high post-operation mortality rates (Azin, et al., 2020; Andrews & Moy, 2015; Campbell & Edwards, 2012; Kissi, et al., 2021; Lucas et al., 2006).

Disparities of Pain Care in Black Americans

Pain is a subjective feeling of discomfort by the patient. Patients express their pain in different and unique ways, but it is ultimately up to a medical professional to assess their pain and develop a treatment plan. Healthcare disparities in pain treatment persist between populations because of the different social environments and power inequalities (Braveman, 2006). There are many contributions to miscalibrations in pain, such as gender and age, but th literature suggests that race is an underlying prevalent factor (Ben, et al., 2017; Fiscella & Sanders, 2016; Fowler-Brown et al., 2006). The false beliefs about different races (e.g., that individuals of some racial groups are more tolerant of pain) might influence the perception of each patient's pain (Trawalter & Hoffman, 2015). Additionally, healthcare providers' medical decisions can also be predisposed by unconscious and conscious racial biases (Featherston, et al., 2020). Consequently, the assessment and management of Black Americans' pain can differ from their White counterparts (Anderson et al., 2009; Hoffman et al., 2016; Trawalter & Hoffman, 2015).

Some studies report physicians giving lower ratings of patients' pain than patients' self-assessments, but this discrepancy is more prominent for patients of color (Anderson et al., 2009; Marquié et al., 2003; Morales, et al., 2020). A review done in 2009 showed that people of color received lesser quality pain care than White Americans in many areas, such as postoperative pain and palliative care (Anderson et al., 2009). Similarly, a review of the literature on the influence of race on pain sensitivity reported that Black Americans had lower pain tolerance and higher pain ratings than White Americans (Kim et al., 2017). Consequently, Black Americans are less likely to receive the needed pain medication.

As evidenced by several previous studies, factors contributing to disparate pain treatments include the patient, healthcare provider, and healthcare system (for review, see Anderson et al., 2009; Green et al., 2003; Lee, et al., 2019). Previous research studies highlight how a lack of access to effective pain medication can affect treatment for Black patients (for review, see Green, et al., 2003; Lee, et al., 2019). Some researchers have argued that racial disparities in pain treatment have historical roots (Robinson-Lane & Booker, 2017) and believe a lack of knowledge and training in medical education contributes to those disparities (Anderson et al., 2009; Morales, 2020). Alternatively, patients can impact pain care without communication when they do not report their pain adequately. A literature review suggests that Black Americans and Hispanics underreport pain because of their fortitude or the possible addiction to being prescribed opioids (Green et al., 2003).

Providers' Attitudes and Stereotypes

Healthcare providers contribute to pain care disparities through their medical judgments. Their judgment could be altered by biases or the social context surrounding each medical encounter (Green et al., 2003). Studies have shown that some physicians and providers are more likely to provide lower pain ratings for Black than White patients (Anderson et al., 2009; Meints, et al., 2019; Staton et al., 2007). Many healthcare providers think Black Americans are less pain sensitive and possess "super" strength (Groenewald et al., 2018; Trawalter & Hoffman, 2015; Waytz et al., 2014). The more healthcare providers express these biases, the more likely they are to mistreat or undertreat Black American patients (Green et al., 2007; Hall et al., 2015; Sabin & Greenwald, 2012; Trawalter & Hoffman, 2015). Some researchers have tied these biases to a lack of empathy (racial empathy bias) resulting from an inability to relate to the pain of Black Americans by White providers (Dore et al., 2014; Drwecki et al., 2011; Waytz, et al., 2014).

Another biological perspective many people, including some physicians, take is that Black Americans have thicker skin, faster blood coagulation, and less sensitive nervous systems than other racial groups (Hoffman et al., 2016). Hoffman et al. (2016) found that a stronger belief in these false biological differences predicted lower pain ratings and less effective treatment regimens for Black patients. Additionally, there is the assumption that most Black Americans have experienced many hardships giving them a higher tolerance to withstand pain (Dore et al., 2014).

Stereotypes about the socioeconomic status of Black Americans might play a role in how they are treated. When Black Americans are part of low and middle-socioeconomic status groups, they are more likely to be negatively perceived than their White counterparts (Ryn & Burke, 2000). Black Americans are perceived as unintelligent, participating in risky behaviors, and not owning insurance, all traits associated with a lower social-economic status (Ryn & Burke, 2000). Although White Americans abuse opioids at higher rates, patients of color are still labeled as drug seekers because of their implied association with risky behaviors leading to reduced opioid prescription (Han et al., 2015; Om, 2018; Singhal, Tien, & Hsia, 2016).

The Current Study

While the race of the patient is undoubtedly a factor contributing to disparate treatments of pain, there is somewhat mixed evidence whether *belonging to a specific racial/ethnic group per se* influences the treatment of pain by healthcare providers (Aronowitz, et al., 2019; Butwick et al., 2016; Druckman et al., 2018; Schulman et al., 1999; Weisse et al., 2001; Tamayo-Sarver, 2003). Therefore, the significance of this work is in identifying whether nursing students' differential treatment of Black versus White patients contributes to racial disparities in the documented problem of chronic pain management. The study set out to recruit nursing students as nurses have the most contact with patients, make triaging decisions in emergency room settings, and can be influential in initial evaluations of patients' pain.

Based on previous work (FitzGerald et al., 2017; Hall et al., 2015), which indicated that racial bias is relevant to patient's experience in the healthcare setting, we predicted that the nursing students would rate Black patients' pain as less intense and urgent than White patient's pain and that Black patients would receive a longer triage wait time than White patients. There is currently limited research assessing racial bias in the attribution of Black Americans' pain to medical or psychological factors. However, Black patients are more likely than White patients to have negative descriptors in their files and receive a malingering pain diagnosis from healthcare providers (Sun et al., 2022; Udoetuk et al., 2020). Therefore, we wanted to investigate the potential biases in the attribution of patient pain. We predicted that White patient's pain would be attributed to medical factors. In contrast, Black patients' pain would be attributed to psychosocial factors. Similarly, we predicted that White patients' pain would be rated as more trustworthy than Black patients' pain. Lastly, there is evidence that Black Americans are rated less likely to adhere to their medication than White patients (e.g., Lutfey & Ketcham, 2005). As such, we predicted that Black patients would be perceived as drug seekers more so than White patients.

Method

Participants

Nursing students were recruited online using a roster of student emails obtained from the School of Nursing at the University of Southern Mississippi. Participants were required to be 18 years or older and English-speaking, but there were no race or gender requirements for the study. There was a sample of N =117 participants. Participants for this study were comprised of undergraduate and graduate nursing students. Eleven participants withdrew at varying stages of the survey. Two participants did not provide their demographic information, and as this was an essential part of the analyses, they were removed from the sample resulting in a sample of N =104. The age range of the participants was from 19 to 57 years old (*Mage* = 27.13, *SD* age = 9.97, N = 104). The gender distribution for 104 participants was the following: 87 females (83.7%), 15 males (14.4%), and 2 not reported (1.9%). Only 100 participants reported their race and ethnicity identification. The ethnic and racial identification of the sample was: White (n = 75; 75%), Black/African American (n = 14;14%), Asian/Pacific Islander (n = 7; 7%), Hispanic/Latino (n = 3; 3%), Native American/American Indian (n = 1; 1%). Of the 104 participants, 98 reported their level of education. Most participants were undergraduate students (n = 66; 67.3%). The rest were graduate students (n = 32; 32.7%) working towards a Doctorate in Nursing Practitioner (n = 17; 53.1%), Nurse Practitioner (n = 8; 25%), or Ph.D. in Nursing (n = 7; 21.9%) degrees.

Materials

The facial stimuli used in this study came from the Delaware Pain Database (MendeSiedlecki et al., 2020). Only 16 faces (8 White males, 8 Black males) exhibiting painful expressions were chosen from the database (Figure 1). The face presented was attached to a clinical vignette that appeared before each question. The vignettes described a 35-year-old man with recurring shoulder pain (Figure 2). The vignette stated that the patient had no other medical problems and did not take any narcotics. Participants evaluated the clinical vignette using The Canadian Triage and Acuity Scale (CTA). The CTA is a chart with five color-coded levels indicating a certain level of urgency based on the patient's severity, see Bullard et al. (2008). There are currently no standardized triage timing procedures; however, this scale is commonly used and is therefore applicable to nursing

students. Participants used the CTA to evaluate the patient's pain and determine how long they should wait to be triaged. Participants were also asked how much of the patient's pain they attributed to medical or psychosocial factors, how much they trusted the patient's pain description, and how likely they were to be drug-seeking. The questions employed were analogous to Chibnall et al. (2018) (see the full list of questions in Table 1 under *Questions*).

Procedure

This study was approved by the University of Southern Mississippi IRB. Data were collected online from December 2020 through February 2021. The study was administered through Qualtrics (Qualtrics, Provo, UT), an online survey builder. Nursing students were emailed a recruitment advertisement with a Qualtrics link to the study. Before starting the survey, participants indicated their consent to participate and confirmed they were studying nursing. The survey data was collected anonymously.

We employed an experimental design with one independent variable, the patient's race, with two levels (either Black or White). Participants were instructed to assume the role of a nurse working in an emergency department and evaluate a clinical vignette about a patient, Mr. John Smith, by answering questions. Participants were randomly assigned to either a Black or White patient condition and randomly shown one out of eight faces representing their respective condition. The clinical vignette detailed the background and current information of a 35-year-old man suffering from chronic left shoulder pain. Participants were asked to evaluate the patient's pain level and wait time to be triaged (in minutes) using the CTA (Level I – Resuscitation, Level II – Emergency, Level III – Urgency, Level IV – Less Urgency, Level V – Non-Urgency). After that, they were asked to measure the percentage of the patient's pain that attributes to (a) medical or (b) psychosocial factors with a 10-point percentage scale (0–10% = Lowest, 91–100% = Highest) (Chibnall et al., 2018). Using a 10-point scale (1 = not at all, 10 = completely), they were then asked how much they trusted the patient's description of his pain and what level of pain severity they thought the patient was expressing (Chibnall et al., 2018). Lastly, they determined how likely the patient is to be drug-seeking on a scale from 1 (Very Likely) to 5 (Very Unlikely). At the end of the survey, participants provided demographic information. They were then given the option to provide an email address to receive an e-gift card and a debriefing form once all data was collected.

Results

Responses to the following questions were treated as outcome variables: 1) Using the CTA, what is the level of Mr. Smith?; 2) Using the CTA, how long should this patient wait to be triaged (in minutes)?; 3) On a 10-point percentage scale, what percentage of Mr. Smith's pain do you think attributes to medical factors?; 4) On a 10-point percentage scale, what percentage of Mr. Smith's pain do you think attributes to psychosocial factors?; 5) On a 10-point scale, how much do you trust Mr. Smith's description of his own pain?; 6) On a 10-point scale, what level of pain severity do you think Mr. Smith is actually expressing?; 7) How likely is the patient to be drug seeking? Responses on the eight faces representing each condition (i.e., the Black or White patient) were aggregated for each question within each condition. There was no evidence of underlying patterns for the missing data; therefore, missing data were excluded on a question-by-question basis.

First, a series of independent samples *t*-tests (Tables 1 and 2) were conducted on each outcome variable to assess the hypotheses. The hypothesis that participants would rate the Black patients' pain as less urgent and severe than the White patients' was not supported, with no differences being found between the rating for Black patients (M = 4.21, SD =.77) and White patient's pain (M = 3.96, SD = 1.06), $t(105)$= -1.41, p =.16. Similarly, the hypothesis that participants would give Black patients a longer triage wait time than the White patient's was unsupported with no statistically significant differences between the ratings that Black patients received (M = 73.40, SD = 37.07), and White patients received (M= 68.50, SD=41.76), $t(98)$=, p=.53.

We also investigated the hypothesis that White patients' pain would be attributed to medical factors more than Black patients' and that Black patients' pain would be attributed to psychosocial factors more than White patients' pain. The hypothesis was unsupported with Black patients (M = 6.71, SD = 2.66) and White patients (M = 7.28, SD = 2.69) having their pain attributed equally to medical factors $t(102)$ = -1.10, p =.28. In addition, White patients (M = 2.92, SD = 1.91) and Black patients (M = 3.35, SD =2.67) had their pain attributed to psychological factors at a similar rate $t(102)$= -.95, p =.35. Further, it was hypothesized that participants would trust the White patient's description of pain more than the Black patient's. However, this was unsupported with Black patients (M = 8.98, SD = 1.31) and White patients (M = 9.04, SD = 1.30), $t(102)$ = .23, p = .82. Lastly, we hypothesized that Black patients (M = 3.83, SD =.80) would be perceived as drug seekers more often than White patients (M = 3.82, SD =.74); however, this was also unsupported, $t(102)$=-.07, p = .95.

We also conducted a set of exploratory analyses, briefly described below. Due to the heterogeneous and unequal nature of participants in each racial/ethnic group, we created a new race variable. Participants were grouped according to the White vs. non-White dichotomy, with all participants who indicated race/ethnicity other than White grouped into the non-White category. After the new variable was created, a series of 2 (race of patient: Black vs. White) x 2 (race of participant: non-White vs. White) analyses of variance were conducted on each of the outcome variables to assess racial differences in all outcomes.

Results of multiple two-way ANOVA conducted on all dependent variables showed no significant results for any main effects or interactions involving the patient's race (see Tables 3 and 4). There was a race of participant's main effect for one outcome variable, the level of trust. The responses to the question, on a 10-point scale, "How much do you trust Mr. Smith's description of his own pain?" showed a main effect for the race of the participants [$F(1, 96) = 6.34$, $p = .013$, $\eta p2 = .062$]. Regardless of the race of the patient, White participants ($M = 8.83$, $SD = 1.39$) trusted the description of the patient's pain less than non-White participants ($M = 9.60$, $SD = .82$). Potential differences between graduate and undergraduate students on racial differences on all outcome variables were also assessed but no differences were found, so they are not reported here due to brevity. All data is available upon request.

Discussion

The current study intended to determine if a patient's race would influence how healthcare pre-professionals judge a patient's pain. Our results did not support the research hypotheses tested. The results of the study suggest that participants (a) rated the Black patient's pain as similar in urgency and severity to the White patient's, (b) triaged the Black patient similarly to the White patient, (c) attributed the White patient's pain to medical factors similar to the Black patient's and attributed the Black patient's pain to psychosocial factors similar to the White patient's, (d) trusted the White patient's description of pain analogously to the Black patient, and (e) did not perceive the Black patients as drug seekers more so than the White patients. In addition, there were no significant interactions between a patient's race and the provider's race for any of the outcome variables in exploratory analyses.

While no significant interactions emerged, there were some non-significant trends. For example, White participants rated Black patients' pain as less severe and gave them longer wait times than non-White participants. However, these results were not statistically significant. As such, no conclusions about the impact of the patient's race and the participant's race might affect pain ratings or triage times can be drawn. The only significant result was that non-White participants were more likely to believe the patient's description of their pain than White participants, regardless of the patient's race. The outcome of this study suggests that there may be a trend towards a lack of or lessening of racial bias among nursing students when treating a patient and are more egalitarian than they were hypothesized to be.

This study's findings were inconsistent with some previous studies revealing that White healthcare professionals assess pain differently based on a patient's race (Hoffman et al., 2016; Drwecki et al., 2011). However, those studies utilized other means of measuring the effects of a patient's race on the providers' perception of pain. For example, Hoffman et al. (2016) measured pain perception based on race by allowing participants to rate pain and recommend treatments for a Black and White patient in a medical case scenario without photographs of the hypothetical patients. Drwecki et al. (2011) used videos of patients displaying painful expressions while doing a range of motion tests, and participants measured the patient's pain using a treatment questionnaire.

There are also other previous studies in which the patient's race did not explicitly influence providers' pain ratings or treatments (Bishop et al., 2023; Green et al., 2007; Mathur et al., 2014; Tamayo-Sarver et al., 2003). Results of this work suggest that White or non-White participants do not deliberately express explicit racial attitudes when they are in the Black patient condition. However, other research has shown that racial biases in pain perception and treatment are partly due to unconscious beliefs (Green et al., 2007; Mathur et al., 2014; Hall et al., 2015), yet this study did not employ the use of implicit measures such as the Implicit Association Task (Greenwald et al., 1998). The lack of significant results does not explicitly mean that the nursing student participants are not racially biased because their responses were controlled rather than more implicit gut reactions. Yet, it is the medical judgment and behavior of the providers that matters for patients' outcomes, and this study attempted to measure them, albeit in a fictional scenario by proxy. Therefore, it is possible to be cautiously optimistic about the results of this study and its clinical significance. At the very least, sharing the results of this study with nursing professors in the institution it was conducted prompted discussions about potential positive effects of the incorporating diversity trainings into nursing school curriculum on patients' outcomes (Huerta, et al., 2021).

It was surprising to see no differences in patient treatment regardless of the race of nursing students and the race of the patients in the exploratory analyses, given the location and history of racial tensions in the south. The student's impartial responses to the survey questions could have been influenced by the ongoing exposure of political and societal culture on campus and the media. Recent events, such as the 2020 presidential election and nationwide protests against police brutality, have led many individuals to support the Black Lives Matter movement and attempt to reduce racial biases. Overexposure to this movement through the media could have affected participants positively or negatively, influencing their acknowledgment and attempted reduction of any biases they might have.

Limitations and Future Directions

This study only used a small sample of nursing students from a southern university. Within that sample, most of the participants were White and female, and there was a considerably lower number of participants of color and males. Future studies should attempt to recruit a sufficient number of various ethnic and racial groups. This sample also does not accurately represent training and practicing healthcare professionals, specifically nursing students, across the country. Future research regarding the same topic should be conducted with more heterogeneous groups of participants coming from various nursing schools in different areas of the country since racial biases, curriculums, and training might vary from school to school. Additionally, future research could employ a similar methodology to assess racial biases among nurses, nurse practitioners, and physicians in various stages of their careers.

Another limitation was the layout and production of this study. The online survey used the face of a male patient, presumably in his mid-30s, displaying a pain-ridden face, so participants' judgments were only based on that and a general clinical vignette. Race could have been included more as a factor in a clinical video vignette by allowing participants to view standardized patients showcasing actual mannerisms and pain expressions. With that, it must also be noted that there are practical differences in nurses evaluating a patient in real life rather than through reading fictional scenarios.

Lastly, another study limitation was the lack of representation across gender and race. While we were able to compare White and non-White participants, future research should delve further into the differences in pain perception among different racial groups. Similarly, as there is evidence of gender differences in pain rating and prescription, it is vital for future researchers to investigate gender differences. Future studies should also consider the use of both genders and different age groups for patients, live patient scenarios, and more different outcome measures.

Conclusion

The current study's focus on healthcare pre-professionals' perception of pain revealed that nursing students do not judge a patient's pain or act differently based on their race. It is appealing to think that nursing students' training prepared them not to exhibit racial biases during the study. However, this sample does not represent all current and future healthcare pre-professionals, so the topic should be further researched. Despite lacking statistical significance, the results have potential clinical significance and several implications. The results have implications for the educational system, possibly highlighting the impact of diversity initiatives implemented within nursing programs by the American Nurses Association (2021). If the results of this study are replicated among other groups of nursing students, it will provide initial evidence of the effectiveness of the interventions. As such, these findings have implications for the training students receive. Confirming that reduction in racial bias among nursing students is based on implementation of new curriculum will, of course, requires further investigation. The results of this study also have implications for clinical practice, highlighting the need for continued training for healthcare providers in the field. In addition, the results have broader implications for pain perception research and for Black Americans interacting with the healthcare system, highlighting the need to investigate other aspects that may impact their experiences with healthcare providers. Healthcare disparities are still prevalent, and the source of disparities begins with the provider and the relationships they develop with patients.

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Figure 1. Facial stimuli exhibiting painful expressions from the Delaware Pain Database (Mende-Siedlecki et al., 2020)

Table 1. *Participants' Ratings as a Function of Patients' Race (N of Participants per Condition, M and SD)*

Questions	White Patient Condition			Black Patient Condition		
	N	*M*	*SD*	*N*	*M*	*SD*
Using the Canadian Triage Acuity Scale (CTA), what is the level of Mr. Smith?	51	3.96	1.06	57	4.21	.77
Using the CTA, how long should this patient wait to be triaged?	48	68.50	41.76	53	73.40	37.07
On a 10-point percentage scale, what percentage of Mr. Smith's pain do you think attributes to medical factors?	51	6.71	2.66	54	7.28	2.69
On a 10-point percentage scale, what percentage of Mr. Smith's pain do you think attributes to psychosocial factors?	51	2.92	1.91	54	3.35	2.67
On a 10-point scale, how much do you trust Mr. Smith's description of his own pain?	51	9.04	1.30	54	8.98	1.31
On a 10-point scale, what level of pain severity do you think Mr. Smith is actually expressing?	50	7.26	1.52	54	7.22	1.62
How likely is the patient to be drug seeking?	51	3.82	.74	54	3.83	.80

Note. Different number of participants across multiple measures is due to missing data. CTA = the Canadian Triage Acuity Scale.

Table 2. *T-tests Associated with Comparison of Means between Participants' Responses in Black and White Patient Condition*

Questions	t-test for Equality of Means			
	t	*df*	*Sig. (2-tailed)*	*d*
Using the CTA, what is the level of Mr. Smith?	-1.41	106	.161	.27
Using the CTA, how long should this patient wait to be triaged?	-.62	99	.534	.12
On a 10-point percentage scale, what percentage of Mr. Smith's pain do you think attributes to medical factors?	-1.10	103	.275	.21
On a 10-point percentage scale, what percentage of Mr. Smith's pain do you think attributes to psychosocial factors?	-.95	103	.346	.19
On a 10-point scale, how much do you trust Mr. Smith's description of his own pain?	.23	103	.821	.05
On a 10-point scale, what level of pain severity do you think Mr. Smith is actually expressing?	.12	102	.903	.03
How likely is the patient to be drug seeking?	-.07	103	.948	.01

Note. Varying degrees of freedom across multiple measures are due to missing data. CTA = the Canadian Triage Acuity Scale.

Table 3. *Participants' Ratings as a Function of Patients' Race and Participants' Race (N of Participants per Condition, M and SD)*

Questions	White Participants						non-White Participants					
	White Patient Condition			Black Patient Condition			White Patient Condition			Black Patient Condition		
	N	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
Using the CTA, what is the level of Mr. Smith?	35	3.91	1.07	40	4.27	.75	14	4.00	1.11	11	3.91	.83
Using the CTA, how long should this patient wait to be triaged?	32	69.94	42.39	40	76.38	35.46	14	62.14	41.96	9	60.00	37.50
On a 10-point percentage scale, what percentage of Mr. Smith's pain do you think attributes to medical factors?	35	7.03	2.40	40	7.35	2.92	14	5.64	3.18	11	6.64	1.63
On a 10-point percentage scale, what percentage of Mr. Smith's pain do you think attributes to psychosocial factors?	35	2.80	1.71	40	3.13	2.55	14	3.29	2.46	11	4.45	3.05
On a 10-point scale, how much do you trust Mr. Smith's description of his own pain?	35	8.80	1.37	40	8.85	1.42	14	9.79	.80	11	9.36	.81
On a 10-point scale, what level of pain severity do you think Mr. Smith is actually expressing?	34	7.50	1.50	40	7.10	1.57	14	6.93	1.49	11	7.73	1.85
How likely is the patient to be drug seeking?	35	3.74	.74	40	3.83	.78	14	4.00	.78	11	3.82	.87

Note. Different number of participants across multiple measures is due to missing data. CTA = the Canadian Triage Acuity Scale.

Table 4. *F-tests Associated with Participants' Ratings based on Patients' Race and Participants' Race*

Questions	Factors		
	Participants' Race	Patients' Race	Participants' Race*Patients' Race
	F		
Using the CTA, what is the level of Mr. Smith?	$F(1, 96) = .42$, $p = .520$, $\eta_p^2 = .004$	$F(1, 96) = .39$, $p = .535$, $\eta_p^2 = .004$	$F(1, 96) = 1.08$, $p = .300$, $\eta_p^2 = .011$
Using the CTA, how long should this patient wait to be triaged?	$F(1, 91) = 1.60$, $p = .209$, $\eta_p^2 = .017$	$F(1, 91) = .05$, $p = .823$, $\eta_p^2 = .001$	$F(1, 91) = .20$, $p = .654$, $\eta_p^2 = .002$
On a 10-point percentage scale, what percentage of Mr. Smith's pain do you think attributes to medical factors?	$F(1, 96) = 2.86$, $p = .094$, $\eta_p^2 = .029$	$F(1, 96) = 1.12$, $p = .292$, $\eta_p^2 = .012$	$F(1, 96) = .29$, $p = .590$, $\eta_p^2 = .003$
On a 10-point percentage scale, what percentage of Mr. Smith's pain do you think attributes to psychosocial factors?	$F(1, 96) = 2.79$, $p = .098$, $\eta_p^2 = .028$	$F(1, 96) = 1.89$, $p = .173$, $\eta_p^2 = .019$	$F(1, 96) = .60$, $p = .440$, $\eta_p^2 = .006$
On a 10-point scale, how much do you trust Mr. Smith's description of his own pain?	$F(1, 96) = 6.34$, $p = .013$*, $\eta_p^2 = .062$	$F(1, 96) = .39$, $p = .533$, $\eta_p^2 = .004$	$F(1, 96) = .63$, $p = .430$, $\eta_p^2 = .007$
On a 10-point scale, what level of pain severity do you think Mr. Smith is actually expressing?	$F(1, 95) = .01$, $p = .939$, $\eta_p^2 = .000$	$F(1, 95) = .30$, $p = .586$, $\eta_p^2 = .003$	$F(1, 95) = 2.70$, $p = .104$, $\eta_p^2 = .028$
How likely is the patient to be drug seeking?	$F(1, 96) = .48$, $p = .490$, $\eta_p^2 = .005$	$F(1, 96) = .08$, $p = .783$, $\eta_p^2 = .001$	$F(1, 96) = .53$, $p = .467$, $\eta_p^2 = .006$

Note. *Factor is significant at the .05 level.

Varying degrees of freedom across multiple measures are due to missing data. CTA = the Canadian Triage Acuity Scale.

Figure 2
Instructions:
Imagine you are a nurse working in the emergency department when Mr. John Smith comes in. Read and evaluate his clinical vignette and answer the following questions to the best of your ability. Click the arrow at the bottom to continue.

Clinical Vignette:
Mr. John Smith, a 35-year-old man, suffering from extreme left shoulder pain presents himself to the emergency department. He weighs 220 pounds and is 6'1". He has been limited in his range of motion while doing his mechanical engineering job due to the strong pressure and strain he feels when reaching and lifting his arm. He began having shoulder pain while playing football in high school and college. After having surgery, the pain eventually dissipated. Recently, the pain came back, and he has been experiencing it for almost 6 months but ignored it to avoid missing work, visiting doctors, and incurring expenses. He has said multiple times that he coped with the pain with over-the-counter pain medication, but it eventually wasn't strong enough to suppress it. He describes this pain as being "stabbed in the shoulder from a very sharp object." He claims that the pain increases extremely whenever he has to move his left arm in any way. It has gotten to the point where he cannot lift his arm past his neck or sleep well at night. He doesn't drink or smoke, and he exercises as much as he can with limited involvement of his left shoulder. He insists that he does not take any routine medication or narcotics other than the occasional drugstore pain medication for his shoulder. He currently has no other medical problems.

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A Double-Edged Sword of Critical Care Nurses' Daily Use of Complex Medical Devices: A Review of the Literature

Abstract

Background: Increasing the use of multifarious sophisticated medical technologies in intensive care Units (ICUs) poses a risk of medical errors and unintentional harm to patients. Medical errors are the third leading cause of death in America. Over 10,000 medical errors occur daily, with an estimated financial impact of preventable mistakes is 20 billion dollars annually. However, limited empirical evidence exists regarding ICU nurses' perspectives and the remedies to this double-edged sword. **Purpose:** This literature review aimed to elucidate published peer-reviewed literature illuminating ICU nurses' perceptions of their use of complex medical devices. **Methods:** This comprehensive review of the literature includes articles published in English between 1980 and 2023 indexed in PubMed, Cumulative Index to Nursing and Allied Health Literature, Scopus, Cochrane Library, Google Scholar, and ClinicalTrials.gov. The Boolean keywords "patient safety AND medical devices, AND critical care nurses, OR technology" were used to conduct the article search. **Conclusion:** The literature review provided an essential foundation for a mixed methods study to inform medical device education standards, intervention research, theory development, and policy changes.

Keywords: *Critical Care Nurses, Safety, Complex Medical Devices, and Technological Competence*

Internationally, healthcare providers utilize over 1.5 million healthcare technologies, and nurses are the largest consumers of technology in hospitals (Ruppel & Funk, 2018; Parissopoulos et al., 2023). National Academy of Medicine reports convey serious concerns about the quality and safety of the American healthcare system, emphasizing the nurse's role in identifying potential errors as vital to patient safety. Nurses are paramount to the safety process from a system and a human factor viewpoint (Henneman, 2017). Medical devices have safety alarms. However, some have security features that activate a maneuver to address the alarm after time has elapsed. Safety designs on other devices may address physiological trends and make necessary changes. The complexity of device alarms, such as similar-sounding alarms or alarms requiring no intervention, can influence nurses' response sensitivity. These alarm nuances inside medical equipment present challenges for nurses (Sowan et al., 2017). A study revealed that 27% of ICU nurses lacked confidence in managing physiologic monitor alarms. Furthermore, 40% of the participants needed to gain knowledge of various alarm features and device capabilities. The most significant finding was the lack of nursing competence in using physiologic monitors (Sowan et al., 2017).

Medical errors, the third leading cause of death in America, are numerous, expensive, and frequently preventable. One in 10 deaths is associated with a medical error amounting to an estimated 400,000 premature deaths annually. Preventable medical errors amount to an estimated $20 billion annually. Factors influencing device-related medical errors include (a) inadequate implementation plans, (b) poor user education programs, (c) data overload, and (d) human factors (Makary & Daniel, 2016; Rodziewicz et al., 2022).

The double-edged sword of the proliferation of new technology in healthcare has significantly impacted nurses' workflow and nursing practice. Smart technology has revolutionized healthcare delivery due to its sophistication and complexity. Consequently, technological advances, such as computerized features, have enhanced and improved patient outcomes. However, these automated features within medical devices may lead to unintentional mistakes due to the constantly changing dynamics between the human-machine interfaces in hospitals (Swayze & Rich, 2012; Ruppel & Funk, 2018; Matinolli et al. 2020).

Regardless of the machines' technical purposes and utilities, nurses must be able to provide safe patient

care. This essential quest is challenged by the fact that even the definition of technology among nurses is nebulous. Swayze and Rich (2012) presented a broad definition of technology that ranges from tongue depressors to complex extracorporeal membrane oxygenation (ECMO) machines. Sophisticated ICU technologies include ventilators, physiological monitors, and Smart IV pumps. A crucial step in investigating related nursing competence and self-efficacy is developing a cogent definition of nursing-related technology. This literature review focused explicitly on ICU nurses' use of complex medical devices. These devices monitor and provide therapeutic interventions critical to maintaining patients' biological and physiological body functions.

Purpose

This literature review aims to uncover the perceptions and practices of ICU nurses in a technologically advanced environment and to illuminate the barriers and facilitators encountered when providing nursing care. This study explored educational strategies for improving nurses' technological competence and safe practice. First, the researcher presents a historical perspective of ICUs and the relationship between technology and nurses. Next, transitions to the current state of complex medical devices in ICUs are described. Next, the review encompasses the Conceptual Model for Technology, Nursing, and Patient Safety Powell-Cope et al. (2008) and discusses the relationship between nurses and technology. Finally, the researcher discusses the viewpoints, perspectives, and research findings in the literature, focusing on the strengths, limitations, and questions that emerged to justify the necessity of further research studies.

Methods

Articles published in English between 1980 and 2023 indexed in PubMed, Cumulative Index to Nursing and Allied Health Literature, Scopus, Cochrane Library, Google Scholar, and ClinicalTrials.gov were selected for this review. The Boolean keywords "patient safety AND medical devices, AND critical care nurses, OR technology" were used to conduct the article search (Rasmuson, 2016). Articles had to be published internationally or in the U.S. The search included editorials, qualitative and quantitative health science research on medical technology, critical care nurses' using medical devices, and patient safety concerns yielding 300 articles from CINAHL, 50 from PubMed, 24 from Direct Science, and 70 from OVID. A review of PubMed and CINAHL using medical subject headings ensured that no relevant content was missed. There was redundancy in the literature abstracts and titles among the databases.

The Emergence of Medical Devices in the ICU

The ICU, designed with technological devices and systems to care for critically ill patients, emerged in the 1950s. Nursing care was not studied, despite being the primary purpose of the ICU. Instead, the focus was on medical devices and doctors. Over three decades ago, Fairman (1992) illuminated that a model to improve patient care was necessary with the evolution of ICU nursing practice. Since the increase in ICUs in the 1960s, technology has become the mainstay of practice. Nurses practiced with data from medical devices paired with observational skills and expertise. The nursing profession began understanding nurses' influence in the ICU and the need to define the ICU nurse's role. Nursing care successfully impacted patient outcomes, validating ICU nurses' role (Fairman, 1992). Cooper (1993) described the intertwining of nursing care and technology in the ICU as a linkage of technology, competence, and care; ICU nurses equated these three elements to saving patients' lives.

Critical Care Nursing and Complex Patient Care Technology

The nurse-technology relationship is one of the healthcare literature's most emerging topics. Complex devices such as ventilators, physiologic monitors, and smart infusion pumps are among the numerous machines ICU nurses utilize to make clinical decisions. Nurses manage multiple devices attached to patients, each equipped with vital, life-saving functions. Device designers must understand how ICU nurses interact with technology to provide care. Unfortunately, few research studies emphasize the ICU nurse's interactions with technology.

Nurses are expected to adapt to new technology with minimal training and support. Lack of training and technical support can result in equipment misuse. Although nurses create workarounds when they are unprepared to use complex devices safely, such behavior can affect patient care.

Technology catalyzes healthcare transformations, while nurses remain the primary consumers. Multifactorial barriers impeding the effective use of new devices include limited resources. Implementation decisions are financially inclined instead of emphasizing practice development. Hospitals face financial challenges associated with implementing and integrating new medical devices. Managers and executives make healthcare technology decisions without engaging frontline nurses who can offer a care-setting perspective. Excluding bedside, nurses can result in overlooking vital elements of safe care. Providing adequate education and

resources and soliciting real-time nurses' feedback are among the top requirements to support new technology adaptation (Ruppel & Funk, 2018; Phillips, 2019).

Conceptual Model

Currently, no theoretical framework is associated with nursing and medical device use. Powell-Cope et al. (2008) created a Conceptual Model for Technology, Nursing, and Patient Safety to illustrate the relationship among nurses' use of technologies using adaptations from Fuhrer et al. (2003) Conceptual Framework of Outcomes for Caregivers of Assistive Technology. Fuhrer's framework concentrates on interventions of assistive technologies and devices ascribed to the physical environment promoting disabled persons' functional independence. The nursing model includes a variety of patient care technologies. The categories of these devices include (a) direct patient care; (b) indirect nursing care; (c) communication; (d) patient protective; (e) nurse protective; (f) patient assessment, monitoring, and surveillance with patient assistive devices; (g) remote patient monitoring; (h) pattern identification; and (i) continuous learning. Within the model are essential factors that are vital to nursing practice.

The nurse-technology theoretical framework needs further development (Rhagnanan-Kramer, 2020) but identifies the facilitating and restraining factors of four workplace dimensions: organizational, social, environmental, and technological. In addition, this framework shows the interconnections of the nurse-technology relationship and the significant impact on nurses' use of technology.

Facilitators and Barriers to Safe Use of Medical Devices

Organizational structure and operations reflect their culture, social norms, and ethical environment. Leadership's commitment to policies, training, resources, and employee engagement defines organizations. Organizations design policies required by the Safe Medical Devices Act of 1990 that allow reporting of equipment safety issues. Reporting systems are used to examine events and improve patient care. Device and user error-related injuries or deaths require mandatory reporting. Despite regulations and increased safety practices in healthcare, more culture change is needed. Lack of engagement among healthcare professionals is a contributing factor impeding the advances of the safety culture (Hignett et al., 2018).

Hospitals struggle with maintaining optimum patient safety due to inadequate staffing and a lack of appropriate technology. In addition, administrators face challenges in providing continuing clinical education and the proper integration of new devices. Despite laws, regulations, and technological advances, studies show an increase in device-related medical errors (ECRI Institute, 2018).

Hospital systems rely on incident reporting systems for adverse events. However, recent studies revealed that physicians and nurses are not reporting serious incidents. Organizational culture was among the challenges, including workload, ergonomics, and human factors issues. A coping strategy for workplace difficulties is modifying work practices. While this strategy provides equilibrium and efficiency, it can lead to unsafe practices and harmful events (Hignett et al., (2018).

A comprehensive literature review concluded that the safety culture in American hospitals is a complicated concept and difficult to comprehend. Thus, presenting an operational challenge to hospital leadership. Hospitals' safety culture is influenced by the increasing expectations of healthcare consumers and external regulatory agencies, assuring the prevention of medical errors and safe care. In addition, organizations are financially challenged to provide sufficient resources and training. As a result, administrators are sometimes uninformed of their decisions' safety implications and unintended consequences when purchasing technology without the end-user's input (Ruppel & Funk, 2018).

The IOM 2004 initiatives included maintaining patient safety by transforming the nurses' work environment. Recommendations for approaches to improving quality and patient safety include: (a) fostering trust between nurses and institutional leadership, (b) involving nurses in executive decision-making, and (c) providing learning opportunities for novice and experienced nurses. (Sherwood & Barnsteiner, 2017). Implementing the IOM recommendations requires effective leadership, especially at the unit level. Clarity of managerial competency and its impact on nurse retention, nurses' job satisfaction, patient satisfaction, and quality outcomes are needed. Further research is warranted to develop managerial competencies and evaluation (Gunawan & Aungsroch, 2017).

Improving the culture of safety requires evidence-based education on the importance of competence and following safe practice guidelines. Governmental agencies support hospitals by promoting the effective utilization of incident reporting systems. Recommendations include a national evaluation system of healthcare technology that encourages all stakeholders to participate and enables the FDA to concentrate on creating policies to promote processes and allow clinicians to use medical technologies safely and effectively. Designers of healthcare technology should focus on the impact on the end user's workflow. Redundancy, irrelevant alarms, and persistent reminder messages may be ignored by end-users as insignificant,

thus promoting behaviors that are incongruent with safe practice. Incorporating safety culture principles into nursing curricula is recommended (Shuren & Califf, 2016).

Technology, Human Factors, and Safe Nursing Practice

The number of device-related errors is increasing, yet the problem remains inadequately understood. What is known is that technology-related mistakes occur for two main reasons: manufacturer-related errors and device-use errors. Understanding human factor principles and how to mitigate the risks of mistakes can significantly reduce harm to patients. Nurses use multiple complex technologies in highly disruptive, stressful work environments. A healthy work environment is essential to promote the strengths, behaviors, and cognitive abilities for the job; hence, they may provide unsafe care and suboptimal job performance (Wei et al., 2018).

Nurses' Experiences When Using Complex Medical Technology

The complexities of new technology, coupled with inadequate training and the urgency to utilize the technology adeptly, are stressful for nurses. Inadequately prepared nurses may experience anxiety and stress when providing care with complex machines leading to fear of technology (Matinolli et al. 2020). International qualitative studies exploring ICU nurses' experiences and perceptions uncovered both positive and negative experiences using technology. Nurses asserted their dissatisfaction with their lack of autonomy in choosing devices to purchase. They viewed technology as essential to their practice but sometimes perceived it as time-consuming and an impediment to care and provided accurate, accessible, and patient-predictive information to manage patients' situations. However, they also expressed feeling overwhelmed, frustrated, and afraid when working with new advanced technology (Vaismoradi et al., 2020; Ozan & Duman, 2020)

Alastalo et al. (2017) interview of ICU nurses showed that despite the abundance of information obtained from medical devices, nurses rely on their assessment skills and trust their observations more than the device. Nurses value technology as a catalyst in critical care nursing practice; however, it can dehumanize nursing care and become a source of anxiety and panic when unfamiliar with the devices. Nurses and physicians disclosed that the rapid equipment turnover creates challenges in learning the nuances of these devices (Matinolli et al., 2020; Ozan & Duman,2020). Ribeiro et al. (2016a) observation of Brazilian ICU nurses' use of equipment revealed inconsistencies in practice, lack of knowledge, and failure to follow procedures.

Study findings on effects of technology on nursing care revealed that younger nurses viewed technology negatively compared to experienced nurses. Novice nurses needed help determining how to harmonize and leverage technology in their practice. A contributory factor was the lack of continuing education on adapting and integrating new technology into nursing practice (Bagherian et al., 2017).

Nurses are responsible for maintaining knowledge and technical skills, while leaders are accountable for maintaining a culture of safety. Mannion and Braithwaite (2017), in a study assessing nurses' perceptions of safety within their work environment, found that despite the presence of safety initiatives to improve the healthcare delivery systems, additional interventions are greatly needed.

Medical Technology and Patient Safety Culture

The investigative framework used to analyze a safety event should provide lessons to the individuals involved in an incident. The approach to understanding the problem consists of addressing (a) the care-management problems, (b) the context in which the event occurred, and (c) the contributing factors to the problem. Hospitals are implementing high-reliability organization (HRO) concepts and strategies to prevent errors and improve patient safety. The HRO principles include standardizing processes, embedding redundancy, fostering teamwork, effective communication, and increased leadership visibility. Nurses are encouraged to speak up and participate in organizational policy development. Empowering staff to report unsafe situations anonymously is another way to improve patient safety (Padgett et al., 2017).

The nature of technology-related errors remains unclear and warrants research for better understanding and safety interventions. Dobrzykowski et al. (2016) reported that using a lean methodology in healthcare operations can result in favorable safety outcomes. Other benefits included improvements in financial and professional service operations. In addition, insight into nurses' safety perceptions and interactions with complex devices can provide baseline information for nurse leaders, educators, and researchers.

Critical Care Nursing and the Practice Environment

Nursing workflow and clinical practice are rapidly evolving due to technological advancements and changes in healthcare policies. In addition to expert clinicians, it takes knowledge and understanding of the systems in which they work to achieve successful outcomes. The workflow processes,

situational stresses, and long work hours contribute to fatigue and increased risk for errors. Unsafe actions such as practice violations, errors, mistakes, slips, and lapses are behaviors that increase the risk of harm in modern, technologically advanced healthcare systems (Ribeiro et. Al., 2016b). Using clinical pathways as a method of behavior modification may improve quality and safety outcomes (Mitchell & Tehrani, 2017).

Critical Care Nursing Competencies

Currently, there is no confirmed theoretical definition of nursing competency. Most descriptions of competency mention one's ability to make reasonable decisions and perform their work. Nursing care is associated with both technical and human skills. Nursing's core competencies are specific sets of knowledge and skills needed to provide patient care safely. Additionally, motivation, maturity, attitudes, astuteness, and approachability are associated with competencies. ICU nurses' competence should include skillful use of medical devices based on their understanding of operational principles and ability to recognize device errors, malfunctions, and artifacts and validate the reliability of the data (Alastalo et al., 2017).

The ICU environment provides an opportunity to conceptualize the fundamentals of nursing practice. A competency framework for critical care nurses consists of three main categories of competence: (a) assessment and interpretation, (b) therapeutic intervention, and (c) evaluation strategies. These are highly complex competencies that require specific criteria to evaluate the work performance of novice and experienced ICU nurses. Alastalo et al.'s (2017) study of ICU nurses concluded that nurses' observation skills were valuable to include in clinical practice education and orientation framework. Martinez (2016) reported findings of technological competence related to caring and clinical decision-making but did not discuss technological competency and how nurses use technology to manage care.

Technological Competence

Technological competence is evident when nurses integrate technology into care delivery using a seamless and harmonious approach that benefits patients, thereby creating a balance between using technology to manage the complexity of human responses and sustaining life. For example, the ICU nurse demonstrates technological competence by stabilizing the hemodynamically unstable patient's blood pressure by titrating a potent vasoconstricting medication while being guided by the blood pressure readings produced by the arterial pressure monitoring device. Nurses are technologically skilled in discerning the meaning of arterial waveform and blood pressure readings using their knowledge and astute decision-making abilities to maintain the patient's hemodynamic stability by manipulating a powerful drug carefully. Proficiency in using advanced technologies allows nurses to focus on the patient while utilizing valuable information to manage the patient's medical condition (Locsin, 2017).

Nurses verbalized the need for more education and training to manage complex medical devices safely. However, many nurses are silent about their deficiency of technical competence, while some reported being self-taught and learning to use technology through trial and error. Inadequate preparation to use medical devices can compromise patient safety, nursing practice, self-efficacy, and consumer confidence. Because of the complexity and continuous development of medical devices, nurses need ongoing and updated clinical education to maintain error-recognition skills and technical competence (Sowan et al., 2017). The literature suggests simulation-based learning as an innovative, effective, and safe teaching strategy for educating ICU nurses (Burnette et al., 2016).

Legal and Ethical Aspects of Medical Technology and Nursing Practice

Nurses have legal and ethical obligations to provide safe patient care when using medical technology. The literature illuminates patient safety concerns related to medical device errors resulting in serious patient injury or death. To improve the safe use of medical devices, leaders and all stakeholders should understand technology-related adverse events and implement safety processes (Sherwood & Barsteiner, 2017). New technology should meet basic alarm safety standards and designed to intuitively anticipate the risk of different types of errors, thereby preventing harm. Devices should include tutorials and educational guides, thus, preparing nurses to manage complicated medical devices better (Winters et al., 2017).

From a moral and ethical perspective, nurses view medical technology as interference with nursing care. The equilibrium between caring and technological effectiveness is a plea for ethical consciousness. An example of the need for nursing conscience is believing a patient who is in pain without a visual or numeral display on a monitor to validate the patient's subjective assessment (Stokes & Palmer, 2020).

Future Nursing and Medical Devices Research

Technological advances contribute to improvements in patient care delivery. However, research is needed to improve the safe use of complex technologies by identifying and addressing the primary sources of

device errors. In addition, government agencies, healthcare organizations, and nursing organizations' partnerships with manufacturers to design and implement new medical technology are necessary.

The U.S. first industry council partnership was established by the Association for the Advancement of Medical Instrumentation (AAMI) with vendors and healthcare professionals from the American Association of Critical Care Nurses to advocate for patient safety. The AAMI acknowledges that medical devices have become more complicated and directly interrelated with patient care delivery. Opportunities identified included a lack of technical competency requirements, inconsistencies in educational programs, and inefficient hospital systems (AMMI, 2016). Future technological developments should involve nurses in designing and ongoing clinical education consistent with best practices. Research is needed to develop tools to monitor and maintain equipment safety, including defining technological competence and designing competencies essential to ensuring safe clinical practice (AMMI, 2016; Fischer et al., 2017).

Suggested Future Research Questions:

RQ1. What are the experiences of critical care nurses working with complex patient care technology in daily practice?

RQ2. What are the facilitators and barriers to using complex patient care technology to provide nursing care?

RQ3. What are nurses' perceptions of the clinical education they received in using complex patient care technology?

RQ4. Which educational strategies are most effective in facilitating patient care technological competence?

RQ5. What challenges do critical nurses encounter when using complex patient care technology to facilitate clinical decision-making and patient care?

Conclusion

This review of the literature has illuminated gaps between nurses' behaviors and attitudes toward new technology in their daily work and developing mastery using these devices. Studies (Matinolli et al., 2020; Orzan & Duman,2020) reported that critical care nurses viewed technology as both a benefit and a hindrance to their practice. The ability to easily retrieve data from the machines was seen as beneficial to patient care. This feature allowed nurses to develop a timely plan of care or to intervene rapidly based on observed patterns and trends. However, nurses felt stressed when using complex medical devices due to the level of difficulty associated with operating them. The perceived usefulness of the technology and ease of using it may contribute to nurses' proficiency and capacity level when they are introduced to innovative machines.

The literature illuminates problems associated with complex medical devices; but not the challenges of American critical care nurses in the current U.S. healthcare environment. There is sufficient discourse regarding technological competence and the importance of complex healthcare technologies. However, the literature lacks a consensus definition of nurses' technological competence. A nurse-technology theoretical framework is necessary for developing nursing technological competence. Limitations of this study were the specific population of ICU nurses and ICU complex devices. This review of the literature examined critical care nursing practice and perceptions of safety when using complex machines and provided an essential foundation for a mixed methods study to inform medical device education standards, intervention research, and policy changes (Rhagnanan-Kramer, 2020).

The following gaps in the scientific body of knowledge were elucidated.

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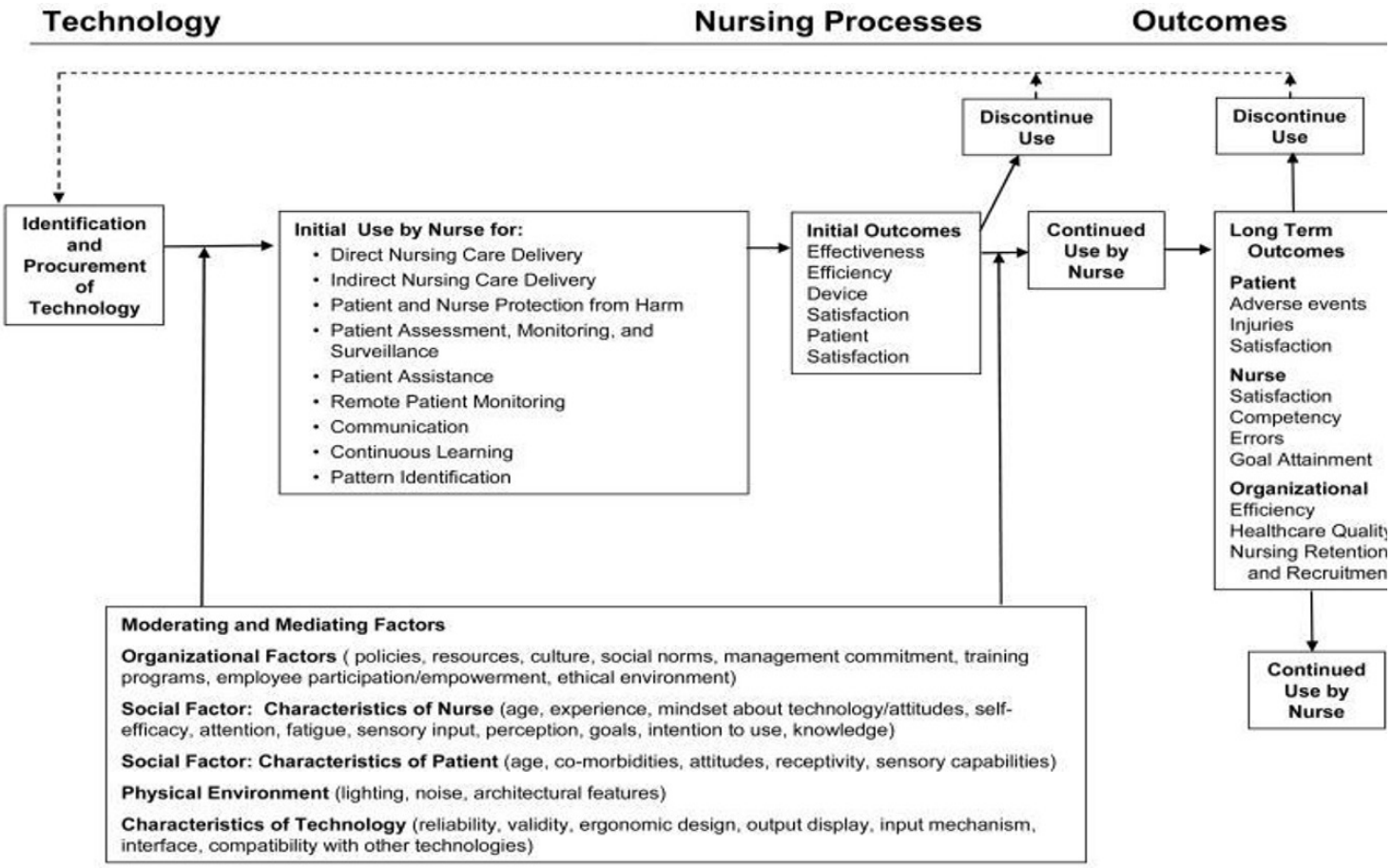
Figure 1

Conceptual Model for Technology, Nursing, and Patient Safety



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