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Enhancing Teamwork and Collaboration in Nursing Students

by

Sharon Walker

A project submitted to the faculty of
Gardner-Webb University Hunt School of Nursing
in partial fulfillment of the requirements for the degree of
Doctor of Nursing Practice

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Abstract

Effective teamwork and collaboration are vital components in the healthcare team's ability to deliver safe, patient-centered care. New graduate nurses play a crucial role in the healthcare team; however, research reveals that many students express anxieties when communicating with other healthcare personnel. The purpose of this project was to enhance students' knowledge and understanding of the importance of effective teamwork and collaboration, ultimately influencing the delivery of high-quality and safe patient care. In an effort to promote better patient outcomes and limit failures, the integration of TeamSTEPPS® training and simulation into nursing curricula offers students an opportunity to build confidence while also instilling an understanding of the importance of their role in teamwork and collaboration.

Keywords: teamwork, collaboration, simulation, nursing students, TeamSTEPPS®, escape room.

Acknowledgement

Philippians 4:13 I Can Do All Things Through Christ Who Strengthens Me.

First and foremost, I want to thank God for his guidance and grace while seeing me through this tough educational journey.

Next, I would like to express my sincere gratitude to my three daughters, Jade, Amber, and Abbey for their support and encouragement every step of the way. I hope they realize through me, that you create your own success and anything is possible with determination and the will to not stop when things seem hard. Your inspiration and confidence helped me to maintain my focus to finish. Thank you for being such wonderful and the best daughters I could ever ask for. I love you!

To my mom, where do I begin? You have always had faith in me, never doubting my ability to be successful. From helping with girls, listening to me vent, cooking, and even cleaning my house when I was just exhausted.

Dr. Tracy Arnold, I feel so blessed you were chosen to serve as my project chair. I would also like to thank Dr. Kristen Barbee, Dr. Michelle Pfaff, and Wingate University nursing faculty/administrative support personnel for helping me navigate this process. Thank you to Dr. Kay Edwards, who took over my teaching load so that I could focus on my project. Your friendship and words of wisdom encouraged me throughout this incredible journey. I also want to thank D'Anna Helms, MSN, RN, soon to be Dr. Helms, your friendship means the world to me. I cannot thank you enough for the laughter and the tears that we have shared throughout this amazing journey. I will forever be indebted to you.

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Problem Recognition

Teamwork and collaboration are essential as they ensure the delivery of safe and effective patient care. New graduate nurses play a vital role in the healthcare team; however, many express that they are uncomfortable with communicating with other healthcare personnel. Novice nurses often lack experience and confidence which contributes to increased anxiety which will potentiate an increase in medical errors. Medical errors and adverse events occur with an incidence of about 9% and can seriously harm patients. Sixty-six percent of sentinel events in hospitals are caused by communication errors (Thompson & Tilden, 2009). According to a recent study by Johns Hopkins, more than 250,000 people in the United States die every year because of medical mistakes, making it the third leading cause of death after heart disease and cancer (Paull et al., 2013). Since 2013, the error rate has almost doubled. North America has declared a patient safety pandemic with conservative claims that at least 400,000 patients are killed accidentally in hospitals every year (Barton et al., 2018). Most medical errors originate from human error and teamwork (Freytag et al., 2017). Facilitating teamwork is critical to avoid failures in the healthcare process that lead to errors. Evidence suggests that improving teamwork is key in reducing medical errors. Many adverse events in health care are caused by teamwork and communication breakdown (Paull et al., 2013).

Background/Significance

Teamwork in healthcare is defined as two or more people who interact interdependently with a common purpose, working toward measurable goals that benefit patient outcomes. Teamwork has become an important health intervention for several

reasons. First, clinical care is becoming more complex and specialized, forcing medical staff to attempt complicated health services and quickly learn new methods. Aging populations, the increase of chronic diseases like diabetes, cancer, and heart disease have forced medical staff to take a multidisciplinary approach to health care. In countries like the United States, medical teams must manage patients suffering from multiple health problems (The HRH Global Resource Center, n.d.). Secondly, research has found that working together reduces the number of medical errors and increases patient safety (The HRH Global Resource Center, n.d.). Teamwork also reduces issues that lead to burnout. No longer is one person responsible for the patient's health; today, an entire team of healthcare workers come together to coordinate a patient's well-being. Third, because teamwork is centered on solid communication, patients and their families sometimes feel more at ease and report they accept treatments and feel more satisfied with their health care. Healthcare workers are also found to be more satisfied with their work. The HRH Global Resource Center (n.d.) conducted a study and found nurses who go through successful team-building efforts are more satisfied with their work. Teamwork and team training are now seen as an essential part of preservice education and learning the fundamentals of teamwork and collaborative care helps students better understand patient needs. The World Health Organization (WHO) recommends that students begin using the principles of teamwork in their education and utilize programs that teach problem-based learning, allowing students to work together, share information, and solve clinical problems as a team (The HRH Global Resource Center, n.d.). In addition, anecdotal comments from nursing students indicate that they feel unprepared to communicate with other health care disciplines (Dufrene, 2012).

Problem Statement

Nursing students must learn to communicate effectively as part of a team to improve overall patient outcomes. Facilitating teamwork and better communication is critical to avoid failures in the healthcare process that can lead to errors.

Literature Review

The widespread demand for dependability among healthcare team members has given rise to many educational initiatives aimed at building team competence. Ineffective teamwork affects patient care quality; therefore, it is difficult to ignore the extent to which patient care quality is being affected by healthcare team performance (Barton et al., 2018). A literature review was conducted utilizing the keywords: teamwork, collaboration, nursing students, patient care, escape rooms, and simulations. The literature review revealed the need to focus on building team competence among nursing students. Research reveals the importance of teamwork and collaboration, thus improving teamwork competency which saves patient lives; it is marked as a priority in discussions about restructuring nursing care provisions. Literature also suggests that nursing students lack the confidence to speak to physicians and other members of the healthcare team due to limited collaborative experiences in clinicals as evidenced by anecdotal comments from nursing students (Dufrene, 2012).

Barton et al. (2018) performed an integrative review to critically analyze empirical published work on competency-based teamwork training interventions in varied nursing education contexts. Nineteen studies were selected and evaluated using established qualitative and quantitative appraisal tools and a systemic constant comparative approach. Researchers concluded this work contributes to a body of

knowledge in modern healthcare about patient safety and quality care improvements achieved through education and better healthcare teams.

Brown et al. (2019) utilized an escape room simulation as a teaching strategy. A total of 33 baccalaureate nursing students participated in the required clinical experience. Following the activity, students completed an electronic survey. Students reported that the escape room forced close teamwork and helped with time management and delegation while practicing skills. Researchers concluded the escape room simulation experience was an engaging teaching strategy, but future research should include further analysis of students' experiences with immersive learning activities in the simulation laboratory.

Dufrene (2012) conducted a literature review to locate interventional studies or program evaluations of interprofessional educational activities of healthcare students. Eighteen articles were reviewed and most focused on student perceptions and feelings regarding interprofessional education. The main overarching outcomes or themes reported by the researchers in relation to interprofessional education with healthcare students were understanding of others' roles and collaboration and teamwork.

Endacott et al. (2015) used an embedded mixed-method design, with a mix of quantitative and qualitative methodologies to examine nursing students' and registered nurses' teamwork skills while managing simulated deteriorating patients. Ninety-seven nursing students and 44 registered nurses were asked to participate in three simulation scenarios. Following the activity, nurses and students were asked to complete the Objective Structural Clinical Examination (OSCE) instrument. Results found objective structured clinical examination performance was similar across registered nurses and students. The study revealed differences in the teamwork behaviors of the nursing

students and registered nurses during the management of the simulation, but the level of technical skills was similar.

Freytag et al. (2017) conducted a prospective experimental study designed to compare a well-established three-phase debriefing method: the GAS method with TeamTag (teamwork technique analysis grid). Thirty-five final year medical students were placed in teams of five. The study compared the effects of two debriefing methods on team performance and acquisition of teamwork skills by a questionnaire. A 7-point Likert scale was used. Results indicated an increase in teamwork skills due to training.

Goliat et al. (2013) did a quasi-experimental study to enhance teamwork attitudes in baccalaureate nursing students. Twenty-one undergraduate nursing students were asked to participate. A pre-test and post-test questionnaire were completed using the TeamSTEPPS® Attitudes Questionnaire. Results showed a significant increase in attitudes towards teamwork attitudes. Researchers concluded that further research is recommended and integration of TeamSTEPPS® team building modules should be explored.

Gómez-Urquiza et al. (2019) performed a cross-sectional descriptive study to analyze nursing students' opinions and study motivations after using the nursing escape room teaching game. One hundred and five students took part in this activity. A questionnaire was completed by 89 participants. The results revealed that the nursing students strongly believed that this helped them learn the subject. Researchers concluded that the escape room is a useful game that stimulates learning, fun and motivates studying.

Hood et al. (2014) did a cross-sectional survey to explore the views of their attitudes towards teamwork. Seven hundred forty-one senior undergraduate students for

six disciplines were asked to participate. After the activity, students were asked to complete the Readiness for Interprofessional Learning Scale (RIPLS). Researchers concluded that overall, students' attitudes towards interprofessional were positive and all students' groups were willing to engage in learning.

Kallio et al. (2018) conducted a qualitative study and content analysis was applied to 150 articles published in a nursing journal by exploring nursing roles and key stakeholders' perspectives to the organizational role expectations in professional services. Researchers concluded five different organizational role expectations for nurses were identified. This study contributes to the research literature on professions by introducing stakeholder expectations as a mechanism that can change nursing professionals' organizational roles. The results of this study can benefit, for example, nursing education, and can also be utilized in nursing management, especially when redesigning nurses' work tasks.

Kutzin (2019) used a gaming theory for an escape room to allow educators to teach about teamwork and communication concepts. A total of 10 registered nurses participated in the escape room. Participants completed a survey to identify if the objectives were met. On the 4-point Likert scale, responses averaged 3.7 to the questions. Researchers concluded that an escape room scenario is a feasible way of teaching health professionals the importance of teamwork and communication.

Krueger et al. (2017) did a qualitative and quantitative study to examine the influence of interprofessional education simulation to assess nursing students' attitudes toward nurse-physician teamwork and collaboration. Two hundred sixty-eight nursing students were asked to complete the survey before and after the simulation experience.

Students used the Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration tool. Results revealed participants had a more positive attitude towards nurse-physician collaboration following the simulation event as compared to before the simulation. Researchers concluded interprofessional simulations may be an effective way to enhance collaborative relationships, which ultimately may influence patient safety and quality of care.

Paull et al. (2013) conducted a study using a before and after design to investigate the effect of a point of care simulation-based team training curriculum on measurable teamwork and communication skills. Twelve facilities using 334 surgical staff underwent simulation-based training. After the simulation, the post-test was compared to the pre-test self-reported data, which included the Self-efficacy of Teamwork Competencies scale. The results revealed that teamwork scores improved for all survey questions. Researchers concluded that simulation-based team training for staff is associated with measurable improvements in teamwork and communication.

Renschler et al. (2016) used a pre-post survey design to assess students' attitudes towards teamwork skills and perceptions of their own teamwork skills. One hundred forty-eight students participated in the study. The Attitudes Towards Healthcare Teams Scale (ATHTC) was used to analyze the participants' attitudes towards healthcare teamwork skills. The results yielded that nursing, public health, and allied health profession students scored significantly higher on their overall attitudes toward interprofessional healthcare teamwork skills. Researchers concluded studies continue to evaluate whether the teamwork and collaborative skills learned and obtained during

participation remain in practice over the course of time when the students become working professionals in the healthcare team.

Yi (2016) did a quasi-experimental study design to assess the effects of team building on communication and teamwork among nursing students. The sample consisted of 195 junior nursing students who participated in team-building activities over a 100-day period. The study used the short form of the Global Interpersonal Communication Competence scale (GICC-45). The findings of the study confirmed the team building activities can induce improvements in teamwork skills and team effectiveness.

Needs Assessment

Target Population/Community

The target population for this project was senior undergraduate nursing students enrolled in a traditional bachelor of science in nursing (BSN) program. The intervention was an escape room using a simulation-based teaching strategy which would be implemented into the nursing curriculum to promote teamwork and to enhance communication skills. This type of simulation can prepare nursing students for high-acuity patients, a deeper level of critical thinking, improved time management, teamwork, and professional behaviors and outcomes associated with effective simulation experiences. It is also believed that serious immersive educational gaming may promote these core competencies (Brown et al., 2019). The targeted group was surveyed before and after the escape room simulation to evaluate whether the students felt as though the experience improved teamwork and enhanced their communication skills. It was expected that the escape room simulation would be an engaging experience and

contribute to their learning and improve their ability to delegate tasks and work as a team (Brown et al., 2019).

Sponsors/Stakeholders

It was important to identify and understand the expectations that stakeholders have towards a professional group. There were seven key stakeholders that were particularly active in setting role expectations for nurses including patients and their relatives, physicians and other healthcare professionals, the work community, the nursing association, and legislators (Kallio et al., 2018). A literature review identified teamwork and collaboration as one of the six competencies required for pre-licensure nursing students to achieve the knowledge, skills, and attitudes to become safe practitioners. The Institute of Medicine recommended interprofessional education for all health care professional students to improve patients care through collaboration (Dufrene, 2012). The key stakeholders for this project were nursing students, nursing faculty, the University, local healthcare organizations (Atrium Healthcare system), patients/family members, and the North Carolina Board of Nursing. Although some were not directly associated with the project, they did have an interest in patient safety.

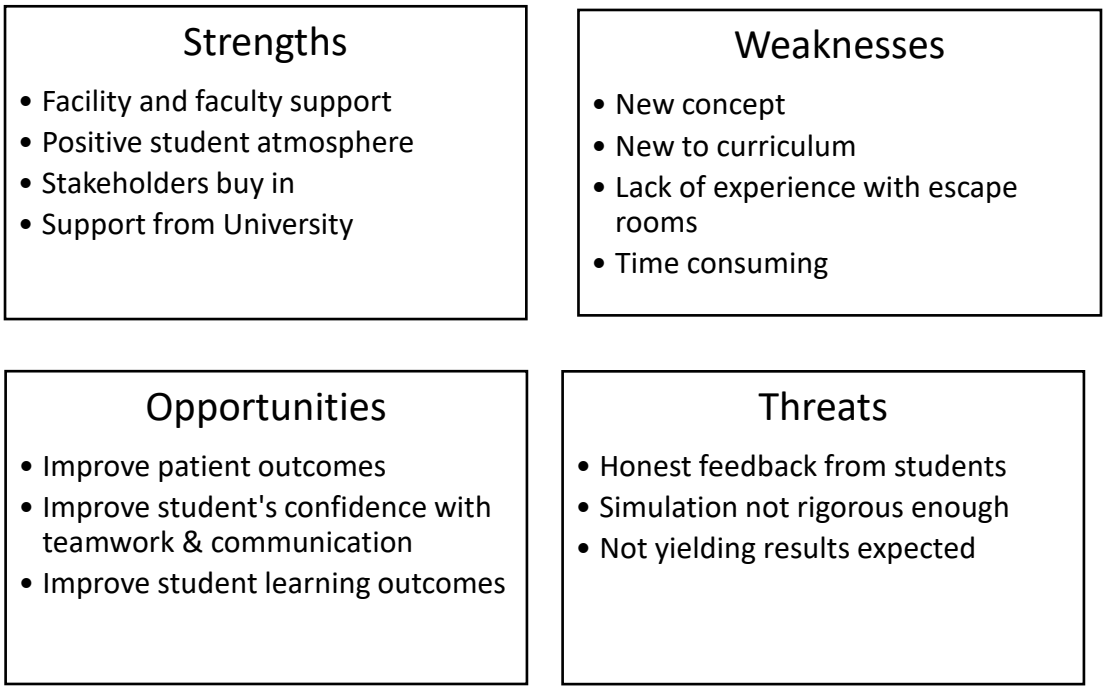
Organizational Assessment

The mission of the University is to develop educated, ethical, and productive global citizens. Following its Judeo-Christian heritage, the university seeks to cultivate the following in its students: faith, knowledge, and service. The mission of the University's department of nursing is congruent with the mission of the University. It is to develop educated, ethical, and productive global citizens who are prepared for purposeful and meaningful service as beginning practitioners of nursing. Through the

cultivation of the core values of knowledge, faith, and service, students will learn critical thinking, clinical reasoning, and judgment, and acquire fundamental skills necessary to address issues of health and well-being. The escape room simulation provided students a safe environment to work through the barriers of teamwork and communication that can hinder patient outcomes and allowed them to become more comfortable with these roles. The project took place on the main campus in the nursing department lab. This project was built into the senior's nursing curriculum during normal class time causing no additional accommodations required by the students. Nursing administration and faculty were dedicated to assisting with the planning and execution of the project. The SWOT analysis is shown in Figure 1.

Figure 1

SWOT Analysis



Threats and Barriers

This project was not anticipated to cause more than minimal risk to participants. Students were required to attend the TeamSTEPPS® training module, Guidelines for Using TeamSTEPPS® Materials (Appendix A) and participate in an escape room simulation. As required in other nursing courses within the program, attendance was counted as a class and/or clinical hours. If students did not attend, their attendance was reflected as missed time outlined in the University attendance policy. Completion of the TeamSTEPPS® Teamwork Attitudes Questionnaire (T-TAQ) was not mandatory. The decision to participate or not participate in the questionnaire in no way impacted the student's course grade. Students received informed consent (Appendix B). The informed consent was reviewed and explained to the potential participants during a face-to-face classroom session. Students were given instructions by the DNP Project Leader, on how to voluntarily opt-in or opt-out of this project. Students remained seated at the computer workstation during the survey period either participating in the electronic survey, if they opted in, or doing computer activities of their choice if they opted out to ensure anonymity. It was unknown to the researcher who participated and who did not. Participants had the right to withdraw from the project at any time without penalty. They also had the right to refuse to answer any question(s) for any reason without penalty. The pre-and post-questionnaires were administered electronically via Qualtrics. Surveys were not linked to the individual students to protect their identity.

Available Resources

The nursing director at a private university in the southeast United States agreed for the escape room to be added to the nursing curriculum and held in the nursing lab.

Another Associate Professor agreed to serve as a project partner. The project partner served as an excellent resource as she completed her project with a focus on interprofessional education experience. Budget options were discussed and were limited, but all copies for surveys and handouts, etc. were supplied by the nursing department. The nursing department had ample space and classroom availability for the project to take place in the lab and scheduled the times accordingly. Faculty were also willing to dedicate their time during business hours to assist with the implementation and execution of this project. Time was the most utilized resource.

Desired and Expected Outcomes

The desired outcome was for nursing students to have an increased understanding of the importance of teamwork and collaboration. It was anticipated that student evaluations would indicate that the team atmosphere and group teamwork improved the most during the simulation. Literature showed that it is evident that students value the experiences gained through simulation education and learn how best to develop collaborative processes that will be useful to them when they become licensed professionals (Dufrene, 2012). Brown et al. (2019) revealed that student feedback and observations by faculty and the simulation facilitator showed that the escape room simulation was an engaging teaching strategy. Due to limited research on serious gaming in nursing simulation, there is potential to gain much information about the development of key nursing competencies, such as delegation, teamwork, and collaboration. Integrating this simulation into the nursing curriculum gave students the chance to build confidence in their teamwork and communications skills to better assist them when they

become licensed nurses to promote better patient outcomes and limit the failures in the teamwork and communication processes.

Team Selection

As a current Doctor of Nursing Practice (DNP) student, the role of team leader was fulfilled by the DNP Project Leader and a doctoral-prepared nursing colleague who served as the project partner. The project partner also served as co-faculty with the senior students and assisted in the simulation. The remaining nursing faculty also helped to observe the simulation and took note of how the students handled situations and gave constructive feedback for simulations in the future.

Cost Benefits and Analysis

No dollar amount can be placed on ways to improve patient outcomes. The simulation was implemented during regular business hours and during normal class/lab times for the students. The indirect costs such as space, power, heating, cooling, internet, and housekeeping were not affected by this project. Surveys were conducted online, so there were no associated costs. Data were analyzed with no associated costs.

Scope of Problem

According to the Agency for Healthcare Research and Quality (AHRQ), healthcare professionals lack the necessary teamwork skills required for successful patient outcomes. The failure to work in teams has been associated with numerous adverse events in health care lack of formal teamwork and instruction leads to situational failure and threatens patient safety. As a result, the Institute of Medicine and the American Association of Colleges of Nursing recommend integrating educational

learning experiences that cultivate teamwork skills that promote high quality, safe patient care (Goliat et al., 2013).

Goals, Objectives, and Mission Statement

Goal

The overall goal of this project was to further advance nursing students' ability to actively participate in teamwork and other collaborative efforts. Increased teamwork and collaboration will improve patient outcomes, thus enhancing the safety and quality of patient care.

Objectives

The undergraduate senior nursing students will:

1. Participate in evidence-based training using tools and strategies created by TeamSTEPPS® methodologies.
2. Implement teamwork and collaboration skills by actively participating in an escape room simulation.
3. Realize and understand the significance of teamwork and collaboration to improve the safety and quality of care of patients.

Mission Statement

The mission of this project was to enhance students' knowledge and understanding of the importance of effective teamwork and collaboration, which ultimately affects the safety and quality of patient care.

Theoretical Underpinning

Teamwork and collaboration have long been identified as core competencies for achieving quality, safe, patient-centered care. Teamwork and collaboration, which is

necessary for collaborative practice, is also one of the six Quality and Safety Education for Nurses (QSEN) core competencies included in both pre-and post-licensure nursing education (Berman, 2013). Poore et al. (2013) describe proficiency in communication and collaboration skills as essential to nursing practice as expertise in clinical skills. Upon graduation, nursing students are expected to practice collaboratively with physicians and other health care professionals using effective communication skills to provide safe quality patient care. Yet not all nursing students experience collaborative learning experiences. Therefore, prelicensure education may be the opportune time to begin building the foundation for the development of collaborative relationships among health professionals (Poore et al., 2013). Kolb's Experiential Learning Theory (ELT) can be used to guide simulation-based education, offering both a foundation and process for knowledge acquisition based on the needs of each individual learner. Kolb's ELT defines learning as the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience (Poore et al., 2013).

The learning cycle, created by Kolb, consists of four phases that include a concrete experience where the learner participates in an experience such as a simulation. The undergraduate senior nursing students participated in an escape room simulation activity to promote teamwork and collaboration. The second phase was reflective observation where the learner reflected on the experience, this rook place in the debriefing phase after the simulation. During the simulation and debriefing, students could interact with one another and the environment while examining their beliefs and ideas. The third phase was abstract conceptualization where the learner considered

thoughts and reflections to identify the significance of the learning experience and considered what may have been done differently to enhance the outcome, this can also be done in the debriefing phase to understand the importance of teamwork and collaboration and to understand if they succeeded in the time limit to complete the escape room. This can also stimulate ideas and offers the students to consider if anything should have been done differently. The fourth and final phase was active experimentation which involved using what was learned to direct future practice. Learners apply the knowledge gained to a new situation such as additional simulations, clinical experiences, or work experiences. Post-surveys will be done to rate the learner's experience and understanding of the importance of teamwork and collaboration. Kolb asserted that learning is a process, simulation represents an instructional design to improve communication and collaboration among health profession students (Poore et al., 2013). Poore et al (2013) state that experiential learning is fundamental to prepare nursing students for professional practice. Although the majority of nursing education has occurred in silos, Kolb's ELT offers both a process for delivering interprofessional education and a mechanism to maximize the learning of each individual student.

Project Timeline

In order to stay on track with the project, a clear, detailed timeline (Figure 2) helped construct and organize ideas to stay focused.

Figure 2

Project Timeline

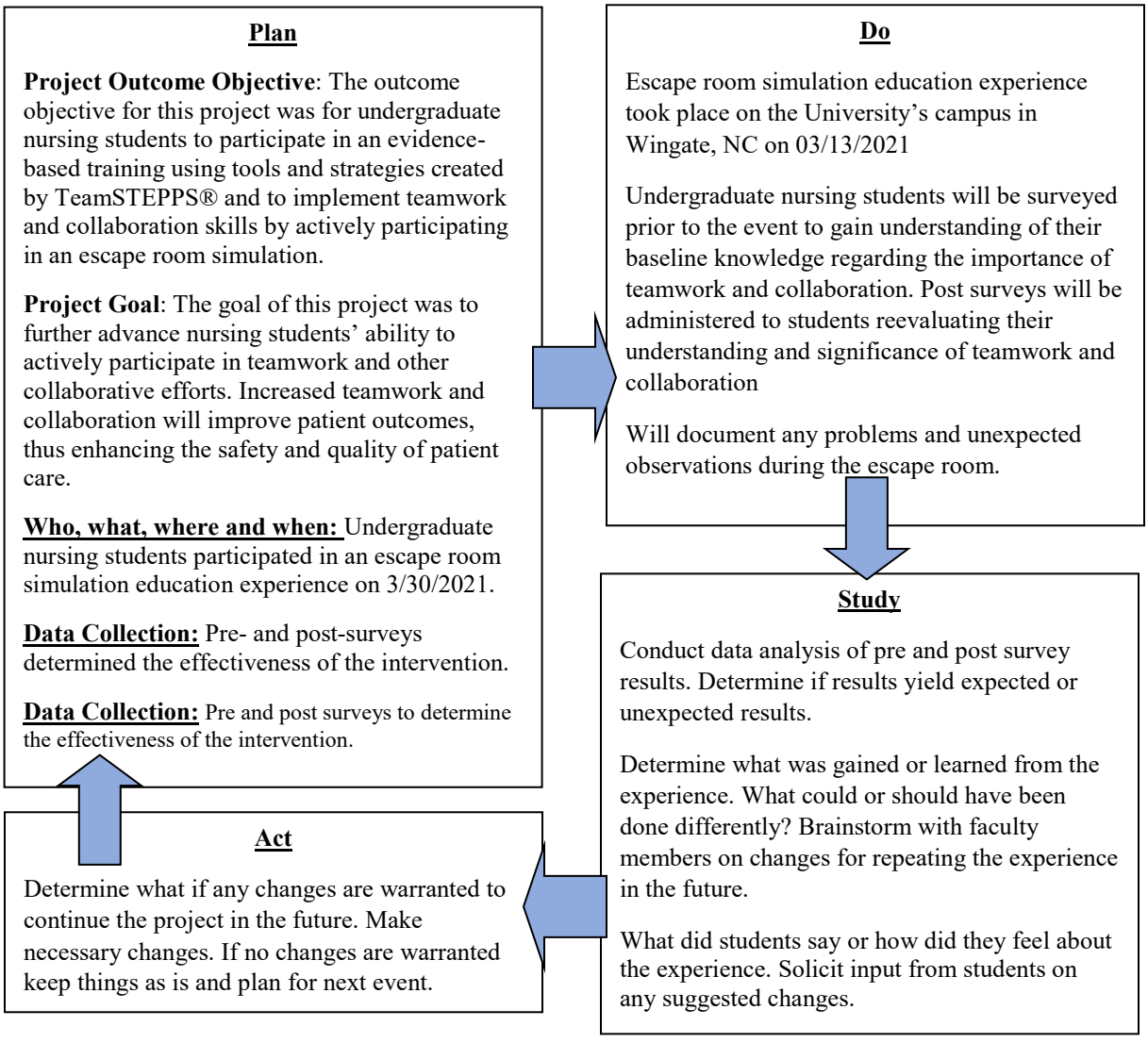
Teamwork and Collaboration Activity Project	Timeline
Planning	
Brainstorming/Met Project Chair	May 2020
Project Idea Selected	May 2020
Met with University Program director for approval	June 2020
Met with Practice partners	July 2020
Research	
Started working on project details	May 2019
Research literature on teamwork and collaboration	June 2020
Design	
Continued revisions to case detail	June-August 2020
Continued work on theory underpinnings, pre/post survey	October 2020
Submitted IRB application to GW Nursing faculty/board	February 2021
Once approved submit Wingate's IRB application	February 2021
Continue to work on logistics of event, details of case	February 2021
Implementation	
TeamSTEPPS® training and escape room	March 2021
Administer pre/post survey to students	March 2021
Preliminary compilation of project results	March and April 2021
Evaluation	
Review and finalize data analysis	March-May 2021
Follow-Up	
Finishing Steps 1-9, writing dissertation	June -July 2021
Scholars Day and completion of project requirements	July 2021

Evaluation Plan

The Plan-Do-Study-Act (PDSA) is the framework that was utilized to evaluate project outcomes for the escape room simulation education experience with undergraduate nursing students (Figure 3).

Figure 3

Proposed Use of PDSA Cycle



The PDSA cycle is a quality improvement model that allows a researcher to determine if there is a need for change with some aspect of the project to achieve desired

results. Terry (2015) reports the PDSA model is optimal because of the well-defined format that requires the researcher to reflect and think about the motivation behind the perceived need for implementing the quality improvement project. The first step was planning which involved establishing project objectives, questioning what the intended action was with project implementation, establishing the who, what, when, and where, as well as determining data collection measures. Next, involved doing or carrying out the established project plan. During this phase of the cycle, problems and unexpected observations were recorded. In addition, data analysis began during this timeframe. The study phase included further data analysis, comparing expected results to real outcomes, and summarizing what was learned or gained from project implementation. Finally, the act stage encompassed deciding what, if any, changes need to be made, when and where will those changes be enforced, and how to proceed with decided changes. Terry (2015) reminds that the PDSA model allows for data gathering from a small study that can then be extrapolated for potential impact in a larger system. Likewise, the use of the PDSA is a quality improvement strategy that can promote the effective use of innovative practices in nursing (Stikes & Barbier, 2013).

Project Implementation

All students received an informed consent form (Appendix B) and a copy of the TeamSTEPPS® Teamwork Attitudes Questionnaire (T-TAQ) (Appendix C) via Qualtrics software prior to the start of the TeamSTEPPS® training. Completion of the pre-survey took approximately 5-10 minutes. Following completion of the T-TAQ, TeamSTEPPS® training was conducted in a classroom. The TeamSTEPPS® lecture slides and activity were for students to understand the importance of teamwork and collaboration. The

escape room was held on March 30, 2021. Students were placed in groups by the DNP Project Leader to work together in an escape room simulation. An escape room teaching simulation is a dynamic option to assess theoretical and practical knowledge that promotes teamwork. The escape room was developed collaboratively by the Code Stroke Coordinator at Atrium Health and the DNP Project Leader for the purposes of this project. There were 3-4 students per group. The escape room consisted of clues and activities for the students to work together and collaborate to complete the simulation by the designated time frame. The students were briefed prior to the simulation (10 minutes) and the simulation ran for approximately 30 minutes.

Project Closure

Students were given a 30-minute timeframe to complete the escape room successfully. Debriefing occurred immediately following the simulation for each group; debriefing lasted approximately 10 minutes. Following completion of the simulation, students were asked to complete the post questionnaire TeamSTEPPS® Teamwork Attitudes Questionnaire (T-TAQ), to compare pre-TeamSTEPPS® training scores. Overall, the project was well received by the Senior level nursing students. All groups were successful in completing the escape room in the designated timeframe.

Results

There was significant data to support that TeamSTEPPS® training and participation in an escape room did improve the nursing students' perception of the importance of teamwork and collaboration. A paired-samples t-test was calculated to compare pre-test scores and post-test scores. The mean on the pre-test was 4.41 (*sd* = 0.08), and the mean on the post-test was 4.73 (*sd* = 0.04). Results were statistically

significant; results revealed a significant increase from pre-test to post-test scores (t (52) = -4.746, $p < .05$).

Conclusion

The desired outcome was met; TeamSTEPPS® training and participation in an escape room enhanced nursing students understanding of teamwork and collaboration. Implementation of an escape room simulation proved to be successful. Post-escape commentary revealed that students enjoyed working in teams and voicing the need to collaborate to successfully move to the next set of clues to complete within the set timeframe. Students valued the experience gained through the simulation and learned how to best collaborate with each other. Where one student was weak, another student was stronger; therefore, they realized the importance of teamwork. Integrating the TeamSTEPPS® and escape room simulation into the nursing curriculum provided students with an opportunity to build confidence in teamwork and enhance their collaboration skills to better assist them when they graduate and become licensed nurses. This project will be integrated into the nursing curriculum and will be offered on an annual basis for both junior and senior-level nursing students.

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Appendix A

Guidelines for Using TeamSTEPPS® Materials

Agency for Healthcare Research and Quality

Guidelines for Using TeamSTEPPS Materials

Master trainers are encouraged to share TeamSTEPPS with colleagues but need to follow certain guidelines.

TeamSTEPPS® is an evidence-based teamwork program aimed at optimizing patient outcomes by improving communication and teamwork skills among health care professionals. The TeamSTEPPS 2.0 curriculum is designed to help health care leaders develop and deploy a customized plan to train their staff in teamwork skills. Organizations report improvements after implementing TeamSTEPPS; visit our Impact Case Studies to learn more.
In addition to TeamSTEPPS 2.0, AHRQ offers ready-to-use curricula, including the core curriculum, as well as specialty modules for office-based care providers, long-term care settings, and rapid response teams. **A TeamSTEPPS Pocket Guide is available through our mobile app.**

The TeamSTEPPS 2.0 modules are in the public domain for noncommercial use within the United States, and you may download the complete set of PowerPoint slides. For commercial use (reproduction and distribution for sale), use outside the United States, and translation of TeamSTEPPS 2.0 into a foreign language, written permission from AHRQ's Office of Communications is required.

Master trainers are encouraged to share their knowledge with colleagues and to use official TeamSTEPPS materials as follows:

- Include the registered trademark symbol (®), as shown above.
- Retain the content without any major substantive changes to the text or tools. For example, TeamSTEPPS includes a tool called CUS, which is an acronym for "Concerned," "Uncomfortable," and "Safety Issue." This content must remain the same (no changes to letters or words) for your training to use the TeamSTEPPS name.

Customizing the materials for your organization is permissible. You may make the following changes and still use the TeamSTEPPS name:

- Modify examples and case studies, which are provided as teaching tools, to reflect your organization's experience.
- Add your organization's name and logo.
- Change images to include scenes from your work or other appropriate images.
- Translate the curriculum into another language or change spelling to British English.

In addition, citation of the source is appreciated. Include as a footnote: TeamSTEPPS was developed by the Agency for Healthcare Research and Quality. For more information, visit www.ahrq.gov/teamstepps.

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Appendix B

IRB Informed Consent Form for Online Survey

Enhancing Teamwork and Collaboration in Nursing Students

The purpose of this project is to enhance the students' knowledge and understanding of the importance of effective teamwork and collaboration, which ultimately affects the safety and quality of patient care as a participant in the project, you will be asked to complete a questionnaire before TeamSTEPPS® lecture and after an escape room simulation The time required is approximately 3 hours. It is anticipated that the training course will be approximately 2 hours, and the simulation will last approximately 50 minutes. The completion of the questionnaire should take approximately 5-10 minutes each. Participation in survey completion is voluntary. You have the right to withdraw from the project at any time without penalty. You also have the right to refuse to answer any question(s) for any reason without penalty. The information that you give in the project will be handled confidentially. Your data will be anonymous which means that your name will not be collected or linked to the data. There are no anticipated risks in this project. You will receive no payment for participating in the project. You have the right to withdraw from the project at any time without penalty by exiting the survey. Data from this project will not be used or distributed for future research studies.

If you have questions about the project, contact:

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Clicking the next button below to continue this survey indicates you are older than 18 years of age and you consent to participate, if you wish to not participate, please close this window.
https://wingate.co1.qualtrics.com/jfe/form/SV_7ZJpfwlG77BYTEG

Appendix C

TeamSTEPPS® Teamwork Attitudes Questionnaire (T-TAQ)

TeamSTEPPS® 2.0

TeamSTEPPS Teamwork Attitudes Questionnaire (T-TAQ)

Instructions: Please respond to the questions below by placing a check mark (√) in the box that corresponds to your level of agreement from *Strongly Disagree* to *Strongly Agree*. Please select only one response for each question.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Team Structure						
1.	It is important to ask patients and their families for feedback regarding patient care.					
2.	Patients are a critical component of the care team.					
3.	This facility's administration influences the success of direct care teams.					
4.	A team's mission is of greater value than the goals of individual team members.					
5.	Effective team members can anticipate the needs of other team members.					
6.	High performing teams in health care share common characteristics with high performing teams in other industries.					
Leadership						
7.	It is important for leaders to share information with team members.					
8.	Leaders should create informal opportunities for team members to share information.					
9.	Effective leaders view honest mistakes as meaningful learning opportunities.					
10.	It is a leader's responsibility to model appropriate team behavior.					
11.	It is important for leaders to take time to discuss with their team members plans for each patient.					
12.	Team leaders should ensure that team members help each other out when necessary.					

PLEASE CONTINUE TO THE NEXT PAGE

TeamSTEPPS® 2.0

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Situation Monitoring						
13.	Individuals can be taught how to scan the environment for important situational cues.					
14.	Monitoring patients provides an important contribution to effective team performance.					
15.	Even individuals who are not part of the direct care team should be encouraged to scan for and report changes in patient status.					
16.	It is important to monitor the emotional and physical status of other team members.					
17.	It is appropriate for one team member to offer assistance to another who may be too tired or stressed to perform a task.					
18.	Team members who monitor their emotional and physical status on the job are more effective.					
Mutual Support						
19.	To be effective, team members should understand the work of their fellow team members.					
20.	Asking for assistance from a team member is a sign that an individual does not know how to do his/her job effectively.					
21.	Providing assistance to team members is a sign that an individual does not have enough work to do.					
22.	Offering to help a fellow team member with his/her individual work tasks is an effective tool for improving team performance.					
23.	It is appropriate to continue to assert a patient safety concern until you are certain that it has been heard.					
24.	Personal conflicts between team members do not affect patient safety.					

PLEASE CONTINUE TO THE NEXT PAGE

TeamSTEPPS® 2.0

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Communication						
25.	Teams that do not communicate effectively significantly increase their risk of committing errors.					
26.	Poor communication is the most common cause of reported errors.					
27.	Adverse events may be reduced by maintaining an information exchange with patients and their families.					
28.	I prefer to work with team members who ask questions about information I provide.					
29.	It is important to have a standardized method for sharing information when handing off patients.					
30.	It is nearly impossible to train individuals how to be better communicators.					

Please provide any additional comments in the space below.

Thank you for your participation!