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THOUGHTS FROM THE LEADERSHIP

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From the Dean's Desk

Reflecting on the Past, Being Grateful for the Present, And Excited for The Future……

Dear Students, Alumni, and Colleagues:

Over forty years ago, Liberty University School of Nursing (LUSON) was founded to train nurse champions for Christ as we align with the mission of Liberty University. As I reflect on the growth and changes that have happened over the decades, I am in awe and grateful to God. LUSON has truly trained Champions for Christ who minister to hurting people with wisdom and compassion across the world.

The initial program was the RN-BSN completion program, which was started in 1983. Thereafter, the full generic BSN program began in 1989. The first class consisted of 40 students and three faculty members in one classroom and a small learning laboratory. While LUSON started off with a mustard seed crew of students and faculty, that mustard seed grew and continues to flourish under God's provision. We now offer undergraduate, graduate, and doctoral degrees in nursing, with over 2600 students. We've also increased our offerings to several specialties, and the online programs have grown stronger. Since I started here in 2007, I have seen exponential growth, and we can attest that the favorable hand of God is upon us.

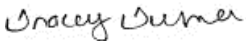
And now, a new step—*Wisdom & Compassion: The LUSON Journal* is a major milestone in the growth of our school. Jesus told us to bear much fruit, "He who abides in Me, and I in him, bears much fruit; for without Me you can do nothing" (John 15:5). Our students and faculty are bearing fruit, and collectively, we will let others enjoy if through the publication in this journal. Such a journal from LUSON is even more essential since there are not many Christian nursing journals.

We're starting this journal because we see the need for strong educators and practitioners who can provide evidence-based care, generate new knowledge, and further the field of nursing. Our students, alumni, and faculty are continually learning more about health promotion, disease prevention, and optimal management of diseases by conducting research studies, integrative literature reviews, Evidence-based practice (EBP) projects, and more. I'm overjoyed to see how we continue to learn and incorporate what we learn into practice to better care for our community. And this journal will allow us to share what we learn and develop to a broader audience.

I encourage faculty and students alike to contribute to this journal to demonstrate your scholarly work. Jesus said, "You are the light of the world, and no one keeps it under a bushel, but keep it for others to see (Mathew 5:16-16). In the same way, this is your opportunity to shine your light so that you, LUSON, and our community can grow together in that light.

Thanks to the editorial board for their courage to embark on the new venture!

Blessings!



Tracey M. Turner, EdD, MSN, RNC-OB *Interim Dean*

Editorial

With the expansion of nursing programs dissertations and scholarly projects are on the rise, but the research to evidence-based practice time gap is still around 15 years (Melnyk, 2021). The current nursing knowledge explosion must be disseminated so that relevant research can be made available to nursing students and professional nurses. According to the International Academy of Nursing Editors (INANE, 2018), there are 251 peer-reviewed nursing journals and additional ones are being considered for inclusion. The Nursology website (2018) indicates that the INANE and the nurse author & editor jointly maintain the directory of nursing journals. INANE also reports the existence of 140 predatory journals in nursing. Some of these nursing journals are exclusively online and others are hard copy prints. Creativity, technology, and time paved the way for publications to be presented as podcasts or videos. Despite the increasing number of peer-reviewed publications, a lack of pages or reviewers results in a small acceptance rate. Therefore, institutions must provide a platform for their faculty and students to publish their scholarly work. Thus, the birth of *Wisdom & Compassion: The LUSON Journal.*
The editorial board members have been collaborating since Spring 2023 to bring the first issue to our audience, primarily faculty, students, and alumni of LUSON. Dr. Kopis brings to the group a wealth of experience in teaching, research, and publications and we are blessed to have her expertise in shaping the coordination of the journal and of this issue. Dr. Boggs brings his unique skills in graphic design and the cover page setup. Dr. Humphreys brings her energy and critical thinking to add to the panel. After much critical thinking and writing to finish her dissertation, Dr. Bell joins us as an alum, and her unique perspective is shaping this journal. We are grateful to Dr. Highton as she committed her expertise in serving as a reviewer. The team was guided well by Mr. Mark Hamilton as the editorial board navigated through the nuances of setting up a journal. We thank Dean Turner, Dean Murphy, and the LUSON Research Council for trusting us with such a responsibility. Above all, we thank God for the team and the support! This will be another step to train nurse champions for Christ in their pursuit of scholarship.

We are grateful to the authors for submitting their hard work and excited that this first issue has submissions from faculty, graduate students (MSN and DNP), and undergraduate students. We pray that this inaugural issue will be useful for all the faculty, staff, and students at LUSON.

Respectfully, LUSON Editors

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Peer Feedback Among Nursing Students: Does it Enhance Learning?

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Teaching is an important aspect of a nurse's role; they teach patients, their families, and novice nurses or newly hired nurses (Irvine et al., 2017). Students must learn the process of teaching in nursing school and develop teaching as they move through different clinical experiences. The process of teaching helps build relationships and improve outcomes (Wu et al., 2018) Giving peer feedback is one way the students can practice and develop teaching skills, benefitting them later in their careers with effective patient teaching. Additionally, giving feedback to another student and receiving feedback from another student will help the receiver and giver of feedback to retain the information (Stenberg et al., 2021). Peer feedback can be generally defined as the process among people of the same professional level critiquing each other's work and giving feedback intentionally to enhance learning and confidence in the performance of those skills. The purpose of this manuscript is to examine the literature on peer feedback and identify the benefits of peer feedback on student learning and information retention.

Definition: What is peer feedback?

Different terms are found in the literature to represent peer feedback. Peer assessment, peer coaching, peer tutoring, peer-assisted learning, and informal peer learning are some of the terms identified. The American Nurses Association (ANA) defines peer 'review' for nurses as:

> the process by which practicing registered nurses systematically access, monitor, and make judgments about the quality of nursing care provided by peers as measured against professional standards of practice…Peer review implies that the nurse is evaluated by individuals of the same rank according to the established practice (Haag-Heitman & George, 2011, p. 48).

The ANA Code of Ethics for Nurses and Peer Review Guidelines identified three contemporary focus areas for peer review—quality and safety, role actualization, and practice advancement (Haag-Heitman & George, 2011). For purposes of this review the term peer feedback will be consistently used. Box 1 describes the principles of peer feedback and these are

essential for excellent nursing practice and patient outcome. This literature review will focus on answering the question, "does peer feedback among nursing students enhance learning?"

Methods

Search terms such as peer assessment, peer coaching, peer tutoring, peer-assisted learning, and informal peer learning were used to identify peer-reviewed publications from databases such as *CINAHL, PubMed, and Google Scholar*. Publications within the last five years were used in this review. Overall, about 24 publications were identified initially. Secondary search and gray literature yielded additional information. The inclusion criteria were relevancy to the topic, conducted in an academic setting, and published within the last five years. A few older publications were included due to their significance to the topic. Only publications written in English were included. It was found that researchers have used different frameworks to examine peer feedback. Frameworks used to facilitate feedback, , use of peer feedback in health care disciplines, advantages and challenges of peer feedback, faculty and student preparation, and common tools used to evaluate peer feedback were identified from the literature and are elaborated below.

Frameworks Utilized to Provide Peer Feedback

Different frameworks can be used to provide peer feedback. Wray's Reflect, Inquire, Suggest, Elevate (RISE) model (Chicca, 2022; Wray, 2015) is suggested as a foundation for student guidance that allows for constructive, tactful, and meaningful feedback. This model aligns with Bloom's taxonomy for higher-order thinking, encouraging deeper and higher levels of critical thinking. Bloom's taxonomy supports the RISE model and facilitates the implementation and evaluation of peer feedback (Chicca, 2022).

Some researchers integrated theories and theoretical concepts on learning to form mastery learning and deliberate practice (Gonzalez & Kardong-Edgren; 2017; Kardong-Edgren, Oerman, & Rizzolo, 2019). These researchers found that initial learning, mastery of skill, and overlearning can improve learning. Feedback during the intermittent practice of the skill can be performed by peers.

The utilization of Objective Structured Clinical Examination (OSCE) often appears in the literature for assessing skills performance. OSCE provides an effective strategy for assessing psychomotor nursing skills using reliable, valid, and practical clinical competence assessment criteria (Cushing et al., 2011; Rush et al., 2012)). The use of OSCE can also enhance skill

acquisition and increase student confidence through simulation. Three roles can be assumed in OSCE, the candidate, examiner, and observer. The students can give feedback to each other in all these roles.

Magnet-designated hospitals use a shared governance model wherein a peer review strategy is used for evaluation of the performance of nurses. Peer review, according to the Magnet standard is defined as "components of an annual evaluation or performance appraisal by which Registered Nurses (RN) assess and judge the performance of professional peers against established practice or organizational standards." (Institute of Medicine, 1999, p. 47). Developing skills in peer feedback in nursing school will help them to understand and embrace the 'peer review' processes in Magnet-designated hospitals as they transition in their career.

While peer feedback is the term consistently used in this manuscript, literature on other terms such as peer assessment, peer coaching, peer tutoring, peer-assisted learning, and informal peer learning are included in this review. Although most of the literature involves students, some publications include others from which we can draw principles. Some activities for peer review included direct observation, writing assignments or active learning activities (Kim-Godwin et al., 2018).

Peer Feedback in Healthcare Disciplines

Peer feedback has been successfully utilized in diverse healthcare disciplines. According to Stenberg et al. (2021) and Carey et al. (2018), the goal of peer feedback (assessment) is to prepare students for collaborative care which is crucial in healthcare professions. They advocate for ongoing collaborative learning to be effective in practice. As healthcare disciplines focus on skill acquisition and competency, peer feedback can focus on the skills. Carey et al. add that it usually happens more in clinical settings and helps develop their clinical role. It has been found that video-based peer feedback has helped enhance robotic surgery skills in surgeons (Carter et al., 2014). The positive impact of video-based peer feedback approach in nursing has long been recognized. In nursing, the ANA published peer-review guidelines as early as 1988 (ANA, 2015). These guidelines laid the foundational principles and conceptual framework for the development of peer review processes and structures that exist today (Tornwall, 2018).

Some studies examined peer feedback among nursing students from different perspectives. Duers (2017) asserts that in addition to evaluating student psychomotor performance skills, human qualities should also be included in student evaluation. Student input

has a significant influence on success, and student involvement in developing peer feedback tools may be more effective and provide a greater positive experience to the students. Ideally, peer-reviewed feedback that is learner-driven and positively focused, builds confidence, raises self-esteem, and results in a positive exchange.

Benefits of Peer Feedback

Peer feedback offers several benefits to the students. It can enhance learning, empower, and increase confidence in students (Carey et al., 2018Stone et al, 2013;). Peer feedback can help nursing students to acquire and strengthen skills (George et al., 2918). The student's communication skills also can be enhanced while providing feedback to peers. It can improve collaboration and support in professional roles, develop clinical knowledge, competence and confidence, and reduce stress and anxiety (Carey et al., 2018; Stone et al., 2013; Topping, 2017)). Several themes regarding peer feedback emerged from the reviewed literature. Advantages of a peer feedback approach include enhanced learning, empowerment, promotion of teamwork and collaboration, critical thinking, and learning to provide constructive feedback (Chicca, 2022; George et al., 2018;Topping, 2017). Peer feedback improves collaboration among different levels of nursing students between junior and senior level students (George et al., 2018), peer feedback improved learning in the receiver and reviewer (Chicca, 2022) and provides a sense of healthy competition among the students, and a new way of learning and gaining experience. Giving feedback improves leadership skills, a perception of increased learning, and an added sense of independence. Giving feedback improves social skills as well (Topping, 2017).

Peer Feedback can Enhance Learning

Peer feedback can be used to stimulate thinking and critical self-reflection in students which will enhance learning. Peer feedback can allow the reviewer to think, self-evaluate, and improve knowledge and performance (Han et al., 2013). Peer feedback is a skill that fosters learner autonomy as demonstrated in formative objective structured clinical examination (OSCE) sessions involving medical and nursing students explored (Cushing et al., 2011). In this study the students took different roles in three sessions the participants gave and received structured feedback immediately after the sessions. Students reported this as valuable in learning; therefore, the researchers used this model to enhance learning both theoretical and skills development. In addition, the students preferred peer feedback over faculty feedback which built confidence and

self-esteem in the students. Tornwall (2018) emphasizes the relevance of peer feedback in sustaining autonomy and accountability in nursing. Cushing et al (2011) reported the transferability of skills to clinical settings in their study involving medical and nursing students. Peer feedback was found to improve metacognition and transferable skills (Topping, 2017). Overall, peer feedback enhanced learning of transferrable skills, and knowing what to look for in others helped the reviewer to improve self-performance.

Peer Feedback Empowers Students

Peer feedback improves learning quality and empowers students. Rush et al. (2012) in their review reported that assessment by peers helps develop judgment-making skills, academic and life skills, and higher future summative assessment scores. They reported many advantages to this approach, including deeper thinking by students on their peer-assessed activity, gained insight into how peers tackle similar clinical problems, how to give and receive constructive feedback to and from peers, and found a shift in perception of the lecturer from just a provider of knowledge to a facilitator of learning. This empowerment will prepare them to communicate effectively with patients and families and provide confidence to teach patient care topics in clinical practice. As patient teaching is an expectation for entry-level nursing practice (American Association of Colleges of Nursing (AACN, 2021), it is important to instill and develop these skills which can be initiated through peer feedback processes. When students give feedback to peers, learning can be achieved in a non-threatening environment.

Feedback from peers is better received than faculty feedback. Giving and receiving feedback fosters growth and independent thinking. however, it should be done in a sensitive and intentional way. The students should know the standards and the required elements of peer feedback and must be prepared to give feedback with respect, sensitivity, and empathy (Cushing et al. 2011; Sackstein, 2017). Students and faculty must learn how to provide feedback appropriately.

Peer Feedback Promotes Student Participation

Peer evaluation is another term used in literature that increases the quality of the learning experience and promotes student participation, particularly in lower-achieving students (Kim-Godwin et al., 2018). Peers evaluate the performance of their peers and provide feedback. Students are encouraged to be more critical thinkers with the use of peer evaluation. This

learning method can help overcome low student participation by necessitating collaboration and teamwork. Fertelli (2019) found that when students assess and give feedback to each other's nursing process in the clinical setting, their critical thinking increases. Thus, facilitating such peer feedback activities will enhance learning, and educators must create supportive learning environments. Students engaging in peer feedback think critically, applying metacognitive thinking processes.

While peer feedback is effective, the educator must be intentional in implementing this. In addition, it must be measured for effectiveness so that the process can be continued or modified for future use.

Facilitation of effective Peer Feedback: Educator Preparation

When designing peer feedback experiences in nursing education, the focus should be placed on supporting a culture of value for giving and receiving feedback. There are five stages identified for peer feedback: focused, descriptive, constructive, blended, and achievable (Tornwall et al., 2022). It is vital that nurse educators intending to create peer feedback experiences include the following elements for effectiveness (Burgess et al., 2020): (1) Provide empirical evidence supporting the role of peer feedback to improve patient safety and care quality; (2) Design the feedback process to encourage students to give high-quality and supportive feedback to peers; (3) Emphasize the significance of peer feedback in the professional duties of nurses and its role in the autonomy and accountability of the nursing discipline; (4) Emphasize the benefits of peer feedback to both the giver and receiver in the exchange of feedback; (5) Allow time during the experience to complete written or verbal peer feedback and implement peer suggestions for improvement; (6) Provide evidence-based instruction on how to give supportive peer feedback and prepare students emotionally to receive critical feedback. Feedback can be given either in written, verbal, or video-based format; it can be blind or open and can be formal or informal.

Students must be prepared to give and receive peer feedback, and this preparation strongly impacts success. In addition to formal training on its use, clear and detailed assessment criteria, rubric, and guidelines ought to be provided to peer assessors (Topping, 2017; Tornwall, 2018). Nurse educators should prepare students both emotionally and cognitively for peer feedback through assistive techniques, including examples of quality peer feedback, opportunities to practice, and training to give supportive feedback, especially negative or

constructive feedback. These techniques facilitate the exchange of supportive and high-quality feedback and increase its effectiveness. Regular and ongoing assessment using appropriate tools must be conducted to ensure the effectiveness of the program and if found deficient, must be revised. Usually, the students learn to give objective feedback with more ongoing opportunities (Topping, 2017). Initial supervision or a test run may allay anxiety in the receiver and giver of feedback. While peer and teacher feedback can vary, Li, et al. (2016) found a moderate correlation in a meta-analysis with a higher correlation in paper-based work rather than computer-based work. Opportunity to provide peer feedback consistently increases effectiveness. While Steckelberg and Li (2004) did not find any difference in learning between control and experimental groups, the students in their study reported positive experiences.

Evaluation of Peer feedback

Researchers have utilized various instruments to examine the effectiveness of peer feedback processes in education. The following investigations and the tools utilized were found relevant.

- Owen and Ward-Smith (2014) used a 10-item tool on a 5-point Likert scale (1 = strongly agree and 5 = strongly disagree) plus four open-ended questions
- Kim-Godwin et al. (2018) utilized the Revised Community of Inquiry (RCOI) instrument (33-item, 5-point Likert-scale questionnaire) and three open-ended questions
- Rush et al. (2012) implemented a Peer Assessed Clinical Skills (PACS) scheme that addressed the skills necessary for nursing students to show competence by the end of the year. Students were given a Clinical Skills Passport in which each skill identified served as a peer-reviewed assessment.
- Ross (2019) utilized an investigator-created, task-specific psychomotor skills competency checklist adapted from existing checklists in nursing textbooks.

While several tools are available, educators must use the right tool to evaluate their processes and have plans in place to improve the processes as needed.

Challenges to Peer Feedback

Peer feedback can present several challenges to the giver and receiver of feedback, as well as to the process. Even when students know the value of peer feedback and have skills, it may not translate into the peer feedback process (Tornwall et al., 2020). Students may feel a lack of expertise in the process. Individual differences may present subjectivity in feedback. Students

may also feel uncomfortable and find it difficult to give meaningful feedback (Chicca, 2022). Another possible challenge is the difficulty in ensuring the accuracy, validity, and reliability of student feedback (Rush et al., 2012). However, providing structure to the experience may help students with the process, and Wray's RISE model (as cited in Chicca, 2022) has been used by several institutions where students are trained to provide feedback to their peers. Conflicts in scheduling, time commitment, challenges in peer relationships, attitude to mentoring, poor communication, inadequate knowledge, and lack of preparation also could be challenges (Carey, et al. 2018; Wong et al., 2016;). The inability to give open feedback was another challenge for students (Ohaja et al., 2013). Maintaining confidentiality also may be a challenge (Shiu et al. 2012). Facilitating peer feedback to and among students in transcultural and multiethnic contexts also requires careful planning and preparation. A summary of the benefits and challenges of peer feedback is provided in Table 1.

Implications

With the current healthcare climate and emphasis on patient safety, it is vital for nursing education programs to prepare competent graduates who can provide all components of patient care skillfully and safely (Ross, 2019). Therefore, nurse educators are challenged to utilize evidence-based teaching methods to promote skill competence and retention that supports safe, high-quality nursing care in various care settings. Team-based learning experiences for students of similar academic levels must be provided to enhance their learning, as well as patient teaching skills. Research findings suggest that peer feedback provides significant student benefits and improves learning outcomes (Kim-Godwin, 2018). Therefore, educators must foster such opportunities. Students value peer feedback, however, may be reluctant due to lack of experience. Students must be trained on how to give and receive feedback and the best practices for such. Introduction of peer feedback skills earlier in the nursing program will help the student to be confident in providing feedback to peers and develop skills to teach patients and families as they transition to practice.

Conclusion

Peer feedback is an important topic to enhance learning in students and help develop skills for patient teaching. While being practiced by several nursing programs and Magnet hospitals, the new AACN essentials (2021) expects nursing programs to promote this through their competency statements. In addition, equipping nursing students to provide peer feedback

aligns with the ANA code of ethics as this practice will assist nursing students' transition to practice. Therefore, it will be prudent for all nursing schools to have peer feedback embedded in the curriculum as they strive to generate well-equipped, competent nurses. Confidence in providing peer feedback and respectfully receiving feedback will not only improve student, faculty, and nurse satisfaction, but also overall competence in nursing skills and practice, thus impacting patient outcomes.

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Incorporating Yoga into Nursing Education: An Integrative Literature Review

M. Lynn Smith, MSN, RN

Lynn Smith, MSN, RN, a graduate of Liberty University, is a military spouse and registered nurse of 32 years. She has nursing experience in cardiac, pre-op, case management, and nursing education. As a volunteer, Lynn serves as a family readiness advisor and on multiple boards assisting military families.

Abstract

Background: Nursing students today are experiencing elevated levels of stress and anxiety. Without any intervention, this could result in student experiences being impacted by stress and anxiety and could influence health outcomes for future clients. This integrative review describes the current literature on yoga as an intervention in nursing education. **Method:** A literature review matrix with Melnyk's level of evidence guided this review and databases searched included EBSCO, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Medline, Sage, and PubMed. **Results:** 16 articles were included in this review including one systematic review and 15 studies that were a mix of randomized control studies, quantitative, qualitative, experimental, and explorative design. **Conclusion:** Yoga as an intervention in nursing education decreases perceived stress and improves wellness which increases learning. Nurse educators can incorporate yoga into the nursing curriculum to promote wellness and increase students' learning.

Keywords: nursing, student, yoga, stress, wellness

Introduction

Wellness is comprised of physical, spiritual, social, emotional, and intellectual health (Ozturk & Tezel, 2021). Being active is one way to contribute to one's wellness. Clark (2018), Nightingale first spoke of a nurse who takes care of their healing process and can blend their inner life with their outer professional life. This statement still rings true today as the American Nurses Association states, in Provision 5, that nurses are responsible for taking care of their whole self and promoting health (2015). Yoga is a form of self-care that decreases stress (Kinchen et al., 2020). Clark (2018) defines yoga as a method or philosophy where one joins the individual self with the consciousness and is aware of their breath. Yoga is done through physical poses, focusing on the mind and awareness of one's breath. The incorporation of yoga in nursing education has the potential to support student wellness and decrease stress. The question for this review is, "Does a yoga intervention improve wellness and decrease perceived stress in nursing students?"

College students today are reported to have a high prevalence of mental health challenges (Tong et al., 2021). The environment of college takes time to get used to as it is a change from home. Studies have shown that college students are more stressed than the general population (Stallman 2010; Yazdani et al., 2014; Ozturk & Tezel, 2021). Health professionals and health professional students, including nursing students, are some of the highest-risk professionals for compromised physical and mental health (Ciezar-Andrson & King-Shier, 2021). Nurse educators facilitate learner development and socialization by giving students the tools to decrease stress (National League of Nursing [NLN], 2023, Competency 2). It is more effective for students to actively participate in yoga than to simply learn about it. (Yazdani et al., 2014; Ozturk & Tezel, 2021).

Methods

Using terms such as nursing, student, yoga, stress, and wellness, databases were searched to retrieve peer-reviewed publications. The databases used were EBSCO, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Medline, Sage, and PubMed. 21 articles were retrieved and 5 were excluded. The levels of evidence (LOE) of the remaining 16 were examined using Melnyk's level of evidence (LOE) (See Appendix A); One article was level one, 10 were level two, three were level six, one was level four, and one was level five. A literature matrix with the articles reviewed is given in Appendix B.

Findings

Of the 16 articles included in this review, one was a systematic review, five were randomized control trials, four were quantitative longitudinal designs, three were qualitative research designs, two were quasi-experimental, and one was an explorative pilot study. The themes identified in the systematic review included yoga, for health professionals and students, decreased anxiety, stress, depression, and musculoskeletal pain (Stillwell et al., 2010). This review also discussed that yoga intervention increases the students' ability to cope in stressful situations and experience less burnout. Improvements in self-care and self-compassion practices were both documented because of the yoga intervention.

Stress and Anxiety

In a randomized controlled trial of 75 healthy university students, Ozturk and Tezel (2021) found that implementing eight sessions of laughter yoga, two times a week with first-year nursing students, resulted in decreased cortisol levels and decreased mental symptoms of anxiety.

A study that focuses on stress, anxiety, and yoga concluded that facilitator support was essential to achieving wellness (Amattayakong et al., 2020; NLN,2023, Competency 8). Stress is an obstacle that can decrease critical thinking skills, according to the nursing students in the focus groups. Perceived stress is stress. LeMay et al. (2019) captured results with the Beck Anxiety Inventory (BHI) and Perceived Stress Scale (PSS). Six weeks of sixty-minute vinyasa yoga sessions for 17 college students showed with pre- and post-questionnaires that there was a decrease in stress and anxiety.

Kinchen et al. (2020) ran a two-group quasi-experimental study with one hour of yoga a week for 12 weeks (about three months). Assessments were administered at three different points during the 12 weeks, resulting in the students' continued perceiving stress regardless of the yoga intervention. At first, this conflicted with the other studies; however, it pointed out that yoga was more of a beginner level with deep breathing and meditation, not as physical. The study also stated that participants who typically practiced yoga did perceive stress less than those who did not. Nemeroff et al. (2022) suggested the yoga intervention could help reduce the need for counseling sessions among college students. Yoga intervention is a cost-effective tool to help mitigate stress and anxiety.

Caring Intervention

Watson's Caring theory was used in incorporating yoga into the curriculum, based on the deep caring of nurses, and socializing nursing students into nursing (Clark, 2018; NLN,2023, Competency 2). The discussion of using Watson's caring theory included educators supporting the growth of compassionate, caring, and intelligent nurses. Watson's caring theory included educators supporting the growth of compassionate, caring, and intelligent nurses. Tong et al. (2021) measured emotions in their study based on Watson and Tellegen’s Circumplex model. It was concluded that perceived stress was mediated by self-compassion and positive emotion. The researchers suggested this finding could benefit college fitness instructors.

At the University of Maine, a Bachelor of Science in Nursing (BSN) program integrated yoga and had 82 students who participated over seven weeks give their final reflections (Clark, 2018). The student reflections showed they applied a three-part breathing technique to nursing education of congestive heart failure patients. Students also reported sleeping better and feeling more relaxed. The study discussed the importance of self-care being taught to nursing students for the students to be equipped to teach the caring-healing process to their clients. Teaching self-

care enhanced the educator-student relationship within the caring environment. According to Amattayakong et al. (2020), it was determined that educators should create a caring environment and promote wellness in nursing students to allow for critical thinking and reasoning by the students.

Achieving Wellness

In a randomized control study of practicing nurses, the researchers concluded that the group with a yoga intervention improved overall wellness compared to a group without the yoga intervention (Patil et al., 2018). Jeitler (2020) pointed out that adding yoga brings awareness to healthy behaviors. Yoga as an intervention improves self-regulation and mindfulness as well as self-compassion (Frank et al., 2020; Erkin & Senuzun Aykar, 2021). The data showed the higher the mindfulness, the higher the self-compassion. Tong et al. (2021) and Xu et al. (2022) also discussed the findings of increased mindfulness specifically and decreased stress. These findings were significant. All studies described an increase in wellness as lower stress and anxiety levels, increased perception of health, and increased self-compassion (Tong et al., 2021; Nemeroff et al., 2022). Nugent et al., (2021) discussed the benefits of yoga to include an increase in social functioning, an increase in perception of health, and immune benefits. Donmez et al. (2023) concluded that laughter yoga increased self-confidence, enhanced vital signs, and decreased stress and anxiety related to simulation-based learning. It was also pointed out that adding yoga brings awareness to healthy behaviors. Yoga was added to regular sports in school and found it positively impacted the quality of life of students (Jeitler et al., 2020).

Evaluation of Findings

There were many similarities between the studies, such as the intent of the yoga intervention, which was delivered to see if the intervention increased wellness and decreased perceived stress. Most of the studies focused on yoga interventions decreasing perceived stress levels in the short term; however, there is a lack of information about the long-term implications of a yoga intervention with decreased stress levels (Erdogan et al., 2020). In 15 of the 16 studies reviewed, the participants were nursing students.

The differences in the studies included the frequency of yoga classes and the length that the classes were run. Another difference is the classification of yoga such as Hatha or Vinyasa used in each study. Some studies had certified yoga instructors and their training varied (Oztuck & Tezel, 2021; Tong et al., 2021).

Limitations

This review has many limitations. As many nursing students are interested in improving wellness, they might have been predisposed to respond favorably to the yoga intervention Ciezar-Andersen & King-Shier, 2021). Another limitation of some of the studies was a lack of diversity, as the participants were mostly female Caucasians. Multiple studies did not provide sufficient details on the type of yoga intervention. There are multiple styles of yoga, and only vinyasa and hatha yoga were mentioned along with the deep breathing technique; however, the details of this stress reduction tool are not thoroughly discussed in many studies. Personal stress and circadian rhythms of individuals are unique to that individual and so cannot be controlled (Ozturk & Tezel, 2021). Group dynamics was considered with one group of nursing students that participated in a study. The designs of the studies varied with the utilization of focus groups, and quantitative, and qualitative data, all of which can show different findings, and therefore comparing may be difficult. One study had level one evidence and ten had level 2 which demonstrated the strength of the findings. The limitations of different yoga styles and levels of instructor training did not change the results of the studies which showed a decrease in perceived stress and improved wellness. Additionally, this review was conducted by only one reviewer.

Conclusion

Existing literature supports the incorporation of yoga into the curriculum and is a proven intervention to promote wellness and reduce perceived stress and anxiety among nursing students (Ozturk & Tezel, 2019; Erdogan et al., 2020; Donmez et al., 2023). Nursing educators can work to integrate yoga into their wellness courses. In this review, two studies discussed yoga theories and three studies discussed nursing theories. The two nursing theories used were Jean Watson's Caring theory and Watson and Tellegen's 1985 Circumplex model. The caring model was the basis for Clark's (2018) study and influences the findings in that all are based on caring for nursing students and client care. Watson's and Tellegen's model is a tool that could be considered in future studies to obtain data on emotions.

Future studies should include further exploration of wellness, more details on the intervention, requirements for instructor training, and how long the effects of the intervention last. Further studies on the effects of yoga on immune function and to mitigate counseling sessions were also suggested. Nursing school is a time to learn the art and science of nursing with only a productive amount of stress and anxiety. Wellness is an important topic where

nursing students learn about themselves and educate patients on achieving optimal health. Experiencing wellness while learning about it can better connect students with wellness.

The Bible states in Matthew 6:22, "The eye is the lamp of the body. If your eyes are healthy, your whole body will be full of light" (*New International Version Bible*, 769/2023). Self-care is a high priority in nursing school. Nurse educators can lead the way by creating a caring environment for learning and incorporating a yoga intervention into the curriculum. The researcher recommends more studies of the effect of yoga on nursing students in simulation, clinical areas, and classroom time. A yoga intervention does improve wellness and decrease perceived stress in today's nursing students.

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Appendix A

Melnyk Levels of Evidence

Level 1 - Systematic review & meta-analysis of randomized controlled trials; clinical guidelines based on systematic reviews or meta-analyses

Level 2 - One or more randomized controlled trials

Level 3 - Controlled trial (no randomization)

Level 4 - Case-control or cohort study

Level 5 - Systematic review of descriptive & qualitative studies

Level 6 - Single descriptive or qualitative study

Level 7 - Expert opinion

Modified from:

Melnyk, B.M. & Fineout-Overholt, E. (2015). "Box 1.3: Rating system for the hierarchy of evidence for intervention/treatment questions" in *Evidence-based practice in nursing & healthcare: A guide to best practice (3rd ed.)* (pp. 11). Philadelphia, PA: Wolters Kluwer Health.

Appendix B

TABLE 1

Hierarchy of Evidence for Intervention Studies

Yoga as an Intervention in College Nursing Education										
APA Reference for Article	Research Methods	Study design	Population & Sample Size	Study Process/ Interventions	Theoretical Framework	Summary of Findings	Details of Potential Bias	Level of Evidence	Included or Excluded	Rationale
Patil, N., Nagarana, R., Tekur, P., Manohar, P., Bhargav, H., & Patil, D. (2018). A randomized trial comparing effect of yoga and exercises on quality of life in among nursing population with chronic low back pain. *International Journal of Yoga, 11* (3), 208-214. https://doi.org/10.4103/ijoy.IJOY_2_18	Quantitative World Health Organization Quality of Life Questionnaire	Randomized control study, single blind design	88 professional nurses similar in age and education, diagnosed with chronic low back pain and working in South India hospital	One hour a day, five days a week of yoga in one group and physical exercise performed in the other group. Each group had 44 nurses in it.	Integrated yoga therapy model used for intervention.	There were higher improvements in the physical, psychological and social domains with the yoga intervention group.	No biases noted.	Level 2a	Included	Well run study that could be reapeated as there is a model for the interventions and detailed data analysis process with a questionnaire created by the World Health Organization on quality of life.
Clark C. (2018). A radical RN-BS nursing class: Outcomes from an integrative yoga elective. *International Journal of Nursing Education Scholarship, 15* (1)https://doi.org/10.1515/ijnes-2017-0073	Rogerian Unitarian Appreciation Narrative Inquiry Analyses Technique	Qualitative Research design	82 RN-BSN students at University of Maine, post traditional students, most female and work full time	Seven week course created after 200 hours of training.	Jean Watson's Human Caring theory was the basis for nursing educators to incorporate self care yoga course into the curriculum.	Self care modalities must be taught to nursing students to teach the caring-healing process through self-care and this also benefitted the educator-student relationship in the caring environment that was created.	Mostly female students and part of the curriculum so the students may have felt they needed to answer in a positive manner.	Level 6	Included	This study is what is being studied put into action so worth looking at for my purposes.
Lemay, V., Hoolahan, J., & Buchanan, A. (2019). Impact of a yoga and meditation intervention on students' stress and anxiety levels. *American Journal of Pharmaceutical Education, 83* (5), 747-752. https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/scholarly-journals/impact-yoga-meditation-intervention-on-students/docview/2260394286/se-2	Beck Anxiety Index, Perceived Stress Scale, and Five facet mindfulness questionnaire, four point Likert scales, self-reporting	Single Quantitative Experimental study	17 college students at University of Rhode Island	90 minute class once a week consisting of one hour of yoga, 30 min of guided meditation over six week period	N/A	Yoga/Meditation intervention decreased stress of college students and increased mindfulness with a 95% confidence interval	Class was led by faculty and participants were first come, first served so there could be favoritism or group dynamics of swaying opinions.	Level 2b	Excluded	Potential bias as this was taught by faculty and the participants were first come first served with only 17 participating in the study.
Kinchen, E., Loerzel, V., & Portoghese, T. (2020). Yoga and perceived stress, self-compassion, and quality of life in undergraduate nursing students. *Journal of Education and Health Promotion, 9*(1), 292-292. https://doi.org/10.4103/jehp.jehp_463_20	Perceived Stress scale, World Health Organization Quality of life-BREF, and Self-Compassion scale used with Likert scales and descriptive statistics, mixed model analyses.	Quantitative Longitudinal Design Study	73 nursing students, 2nd semester and divided into two groups, then broken down into two more in the no intervention group to doing yoga on their own or not at all.	Intervention group participated in one hour yoga class each week x 12 weeks and held at the end of the day-3pm.	N/A	No significant difference over time between groups in the perceived stress or quality of life. There was a difference in the self kindness but overall dissapointing findings and request further studies as the students continued to be stressed and it is a consideration that the timing of the intervention was stressful as they were too busy and ready to get home by that time.	Self selection, convenience sample however good point that randomization could lead to attrition.	Level 2b	Included	IRB approval and could be important data that the perceived stress was still high when the intervention complete at the end of the school day.
Amattayakong, C., Klurklin, A., Kunawiktikul, W., Kuntaruksa, K., & Turale, S. (2020). Wellness among nursing students: A qualitative study. Nurse Education in Practice, 48, 102867-102867. https://doi.org/10.1016/j.nepr.2020.102867	Focus group discussions with a trained principle investigator to gather information and code the data. Results were shown to particpants once calculated to make sure there were no mis-interpretations.	Qualitative Descriptive Design	80 participants of nursing students selected with like experiences, views, and characteristics from two Northern Thailand colleges, 40 students from each school.	50-90 min discussion sessions with set questions on thoughts of wellness. maximum of 10 people per session.	N/A	There were stressors identified that caused obsticles to the nursing students wellness. It was determined that the school environment should promote wellness to allow for critical thinking and reasoning that results in better care for patients if nursing students have an environment of caring and self-care promotion.	Data collected only from public institutions so views and opinions would likely be similar.	Level 6	Included	The principle investigator was trained and compiled a large number, 80, of student's perspectives on wellness. The data was read back to verify accurately interpreted much like repeating what someone says to make sure it was heard correctly.

APA Reference for Article	Research Methods	Study design	Population & Sample Size	Study Process/ Interventions	Theoretical Framework	Summary of Findings	Details of Potential Bias	Level of Evidence	Included or Excluded	Rationale
Erdoğan Yüce, G., & Muz, G. (2020). Effect of yoga-based physical activity on perceived stress, anxiety, and quality of life in young adults. *Perspectives in Psychiatric Care, 56* (3), 697-704. https://doi.org/10.1111/ppc.12484	Perceived Stress scale, World Health Organization Quality of life-BREF, and State Triait anxiety scale used with Likert scales were used at baseline and completion.	Semi-experimental ,non-randomized quantitative study with a control group.	44 Nursing students in the yoga intervention group and 45 in the control group from a public university in Turkey.	60 min yoga intervention with description of each component once a week x four weeks total.	N/A	Yoga intervention with nursing students decreases perceived stress and state anxiety levels but does not effect trait anxiety or quality of life in the short term of four weeks. Recommended to intervene with yoga for young adults to decrease stress and anxiety.	Participants were volunteers from one university only.	Level 6	Included	Most yoga intervention studies are volunteer participants and from one-two universities so this did not exclude the results in my opinion.
Berlowitz, J., Hall, D. L., Joyce, C., Fredman, L., Sherman, K. J., Saper, R. B., & Roseen, E. J. (2020). Changes in perceived stress after yoga, physical therapy, and education interventions for chronic low back pain: A secondary analysis of a randomized controlled trial. Pain Medicine (Malden, Mass.), 21(10), 2529-2537. https://doi.org/10.1093/pm/pnaa150	Perceived stress scale and sensitivity analyses using various imputation methods for anymissing data were used along with the fear avoidance beliefs questionnaire. The back book and back pain help book were distributed to participants.	Assessor-blinded parallel group randomized controlled trial.	Low income, radically diverse adults with chronic low back pain and with a mean age of 46.4 from a large academic safety net hospital or federal community health center.	Hatha yoga or high-dose physical therapy for 15 hour sessions x 12 weeks one on one were completed along with the back pain book education.	N/A	There was noted group improvement that the interventions decreased perceived stress. 95% confidence interval noted.	No biases noted.	Level 2a	Excluded	The mean age being 46.4 was higher than the average college age students that were intended to investigate for my purposes.
Jeitler, M., Högl, M., Peters, A., Schumann, D., Murthy, V., Bringmann, H., Seifert, G., Michalsen, A., Stöckigt, B., & Kessler, C. (2020). Qualitative study of yoga for young adults in school sports. *Complementary Therapies in Medicine, 55*, 102584-102584. https://doi.org/10.1016/j.ctim.2020.102584	Focus group discussions, three in total with 5 participants in each, with free text short answer questionnaires were conducted. Discussions were audio recorded and transcribed verbatim. The results were analyzed using qualitative content and data pseudonymized with software that completed a coding process. Descriptive free text summary also used.	Qualitative Descriptive Design(Quantitative results published in a different paper). Non-randomized continuous pragmatic pilot study with active control group.	92 particpants with a mean age of 19.6 from two schools in Berlin with a active control group of students participating in school sports. All particpants were screened to have no health issues.	90 minute yoga sessions with basic moves on a written plan for 10 weeks taught once a week by certified instructors.	N/A	Yoga is a valuable addition to regular sports in schools to result in a positive impact on qualtiy of life and increase healthy behaviors while also creating awareness of unhealthy behaviors in school age students.	Potential for group decision as focus group is used.	Level 5	Included	The average age of 19.6 is target population of age. Well run study.
Frank, J., Seifert, G., Schroeder, R., Gruhn, B., Stritter, W., Jeitler, M., Steckhan, N., Kessler, C., Michalsen, A., & Voss, A. (2020). Yoga in school sports improves functioning of autonomic nervous system in young adults: A non-randomized controlled pilot study. *PloS One, 15*(4), e0231299-e0231299. https://doi.org/10.1371/journal.pone.0231299	Heart rate variablity using baseline ECG and at the end of the ten week session was conducted on 34 students that agreed. Analyses of variance (ANOVA) followed by t-tests and post-hoc tests estimating both statistical significance was used.	Non-randomized explorative, two aim controlled pilot study with active control group.	92 total students in population with a mean age of 19.9 participated and 34 total agreed to the ECG objective, non-invasive tool. The students were healthy secondary students in Berlin, Germany.	90 minute yoga sessions, taught by external instructors, once a week X 10 weeks total with a control group of school sports without yoga sessions.	N/A	Improved self reulation of the autonomic nervous system was found in the yoga intervention group compared to school sports alone.	No biases noted.	Level 2b	Included	Well run study that has a different data element which is useful to consider.
Ozturk, F., & Tezel, A. (2021). Effect of laughter yoga on mental symptoms and salivary cortisol levels in first-year nursing students: A randomized controlled trial. *International Journal of Nursing Practice, 27*(2), e12924-n/a. https://doi.org/10.1111/ijn.12924	Brief symptom inventory applied prior to sessions one and eight, descriptive questionnaire, and saliva tests pre and post intervention were conducted in both groups.	Randomized control study and pre-post-test design.	Population of 202 state university nursing students in their first year with 38 students fully participating in intervention group and 37 in the control group, randomly selected and all healthy.	Eight session total of laughter yoga with a certified instructor who is also the researcher. Sessions were 40-45 min each and two times a week for four weeks.	N/A	Laughter yoga decreases cortisol levels significantly with 92 % confidence interval in first year nursing students and also decreases mental symptoms such as anxiety and depression. Recommended to incorporate laughter yoga into nursing curriculum and further studies to be done.	Potential bias with the yoga instructor also being the researcher.	Level 2a	Included	Accurate data even with potential bias.
Erkin, Ö., & Şenuzun Aykar, F. (2021). The effect of the yoga course on mindfulness and self-compassion among nursing students. *Perspectives in Psychiatric Care, 57* (2), 875-882. https://doi.org/10.1111/ppc.12630	Personal data form, mindful attention awareness scale, and self-compassion scale were administered pre yoga intervention and post 14 weeks of intervention in single group population.	Quasi-experimental single group pre and post test design study.	47 Nursing students in their first year at Ege University in Turkey who selected the elective of "Yoga for healthy life" course.	Fourteen week course and yoga sessions were 90 min each x 14 weeks. The course was taught by the first author of the study.	N/A	Post yoga intervention the increase of mindfulness and also increase of self-compassion was statistically evidenced. The higher the mindfulness, the higher the self-compassion was shown in the data.	Potential bias of the yoga instructor being the first author could have influlenced the students' perceptions. All female student were non randomized, self selected.	Level 4	Included	Data obtained from target population.
Parajuli, N., Pradhan, B., & Jat, M. (2021). Effect of four weeks of integrated yoga intervention on perceived stress and sleep quality among female nursing professionals working at a tertiary care hospital: A pilot study. *Industrial Psychiatry Journal, 30*(1), 136-140. https://doi.org/10.4103/ipj.ipj_11_21	The perceived stress scale and Pittsburgh sleep quality index were administered pre and post intervention.	Non-randomized quantitative experimental pilot study.	33 female nursing professionals with a mean age of 40.6 in a tertiary hospital located in Delhi, India. The professionals were recruited. healthy individuals.	The intervention was a 45 min yoga class daily for five days a week and lasted four weeks.	N/A	Yoga class as an intervention for nursing professionals was shown to decrease perceived stress by 27% and increase sleep quality by 38.68 % . The yoga intervention was concluded to be a cost effective tool for nursing professionals to decrease stress and improve sleep. More robust and larger sample studies recommended.	There was not encough information given in the article to determine bias other than all female population.	Level 4	Excluded	The mean age being 40.6 was higher than the college age students that were intended to investigate for my purposes.

APA Reference for Article	Research Methods	Study design	Population & Sample Size	Study Process/ Interventions	Theoretical Framework	Summary of Findings	Details of Potential Bias	Level of Evidence	Included or Excluded	Rationale
Nugent, N., Brick, L., Armey, M., Tyrka, A., Ridout, K., & Uebelacker, L. (2021). Benefits of yoga on IL-6: Findings from a randomized controlled trial of yoga for depression. *Behavioral Medicine (Washington, D C), 47*(1), 21-30. https://doi.org/10.1080/08964289.2019.1604489	Lab draws of inflammatory markers, IL-6 and TNF-α drawn pre during and post intervention. All qualified personnel for lab draws and instructors. Consents signed and IRB approval. Quick inventory of depression symptomology administered. Six month follow up included.	Randomized control trial with pre, during, and post sample collection. Quantitative data collected.	122 adults with major depressive disorder that are not fully responding to pharmacotherapy were included and a computer randomly assigned the adults to either intervention group. The adults did not have any other psychological issues and also had a mean age of 45.2. 48 participants in the yoga group, 39 in education control group.	The Hatha yoga intervention was a detailed plan and 80 min session once a week for 10 weeks. The sessions were offered twice a week but only one attendance per week necessary. The control group was a healthy living workshop with multiple topics offered several times as well and a 60 minute session X 10 weeks, once a week.	N/A	The Hatha yoga intervention resulted in improvements in social functioning and the participants had an improved health perception of themselves versus the control group over time noted at the six month follow up. Further research needed over time to see long term effects. The data showed immune benefits after participation in the Hatha yoga trial.	The researcher's spouse was employed by the pharmaceutical company that helped fund the study however there isn't a result that would benefit a pharmaceutical company noted.	Level 2a	Included	High level of evidence and while the population age is higher than my target age, the data is important to research in future studies with college age students too.
Tong, J., Qi, X., He, Z., Chen, S., Pedersen, S., Cooley, P. Spencer-Rodgers, J., He, S., & Zhu, X. (2021). The immediate and durable effects of yoga and physical fitness exercises on stress. *Journal of American College Health, 69*(6), 675-683. https://doi.org/10.1080/07448481.2019.1705840	The four scales used were an emotion scale, Self-Compassion Scale, Lovibond Stress Scale, and Mindfulness Attention Awareness Scale and Likert scales were analyzed with software. The salivart cortisol levels were taken pre one day aournd week 4 prior to intervention and post intervention.	Quasi-experimental study design. IRB approved.	Total population for study one was 191 undergraduate students randomly selected at a Chinese University with an average age of 20.0 and no other health issues. 97 enrolled in yoga class and 94 in the fitness class with study determining immediate effect of one session. Study two was effect of 12 sessions of once a week one hour session. intervention and 143 college students participated.	Study one was one 60 minute session between week four and five of yoga in one class and fitness in the other. Study two was a 12 week session of one hour yoga or fitness taught by certified instructors. Classes were well designed and detailed to be able to repeat.	Emotional scale based on Watson and Tellegen's 1985 Circumplex Model.	The results showed a significant increase in mindfulness after the yoga intervention and a decrease in stress after both the yoga and fitness interventions with more of a decrease with the yoga intervention. The immediate effects were more noticeable in the yoga intervention with increased positive emotion and decrease in negative emotion. Self-compassion is increased even after one 60-minute session. The effect of yoga can be sustained by continuous participation so is said to be a great option for college age undergraduate students in dealing with stress to reduce it.	The data collection was funded by PeKing University standard research of yoga teaching project(2016).	Level 2a	Included	Target population criteria met. High level of evidence study.
Ramick, M. , Cunningham, O. , Razon, S. , Harris, J. & Reed, M. (2022). The Effects Of A Regular Yoga Practice On Mental Health In College Students During COVID-19. *Medicine & Science in Sports & Exercise, 54* (9S), 410-411. doi: 10.1249/01.mss.0000880220.51191.0b.	The State of Trait Anxiety Scale, Perceived Daily Stress Scale, and physical activity (IPAQ Short form) were given pre and post intervention online.	Non-randomized quantitative experimental study	45 total college students with 24 participating with yoga intervention online via zoom and 21 continuing their normal exercise routine.	Zoom yoga of 150 minutes/week over 12 weeks during the Covid pandemic. Control group encouraged to continue normal exercise routine. Both groups were surveyed prior the study to determine physical activity level.	N/A	There was no iprovement noted in the anxiety or stress levels of the students in the yoga intervention on zoom group durig the Covid pandemic.	Not enough information to determine any potential bias.	Level 5	Excluded	This is target population however the intervention being on zoom and during a pandemic is not what is being studied. Conditions were too rare at that time to consider.
Nemeroff, R., Harden, A., & Kowalsky, B. (2022). Yoga classes as an early intervention for college students reporting high levels of stress and anxiety: A pilot study. *Journal of American College Health*, 1-7. https://doi.org/10.1080/07448481.2021.2008401	The Perceived Stress (PSS) Scale, Beck Anxiety Inventory, State Trait Anxiety Indicator(STAI), Penn State Worry Questionnaire, and the Rumination Reflection Questionnaire were all administered at the beginning, middle(3 week mark) and post intervention points. Average confidence interval of all assessments was 83 %.	Non-randomized quantitative study approved by IRB	26 volunteered for the study, eleven participated and only seven completed the questionnaires. The seven were college students that had scored high on PSS and STAI also without any physical limitations.	Six weeks of Hatha yoga for one hour sessions two times a week.	Hatha Yoga Model	The results clearly showed a decrease in stress, anxiety, and worry with the quantitative data. It was suggested that Hatha yoga is in the curriculum for college students as a cost effective way to manage stress and anxiety. The recommendation also pointed out this could help with increased demand of counseling appointments by college students.	Potential bias is that the participants are volunteers however all participants in self care must volunteer for this.	2b	Included	This study was small but effective in the intent and delivery.
Xu, D., Wu, H., Ruan, H., Yuan, C., Gao, J., & Guo, M. (2022). Effects of yoga intervention on functional movement patterns and mindfulness in collegiate athletes: A quasi-experimental study. *International Journal of Environmental Research and Public Health, 19*(22), 14930. https://doi.org/10.3390/ijerph192214930	The Funtional Movement Screening tool and the Mindful Attention Awareness Scale were used with 8.7% Confidence interval and given pre and post intervention. Software analyzed results. Ethics approved and informed consent for participation.	Non-randomized control quantitativee experimental study.	Eighty total participants that were college age and recruited from sports training classes in an Athletic school. The participants did not have prior yoga experience. 39 in the yoga group, 41 were in the control group.	12 weeks of 90 minute sessions of Astanga yoga for two times a week was the intervention along with regular classes and the control group was no intervention along with regular classes.	N/A	The study looked at functional movement and found increases in this as well as increases in mindfulness of college age students. The results of increased mindfulness far exceeded the control group.	Potential bias would be the students are already in an athletic training environment.	2b	Included	This study was on the target population age and well run.
Dönmez, A., Altıcı, N., Kapucu, S., & Elçin, M. (2023). The effect of laughter yoga applied before simulation training on state anxiety, perceived stress levels, self-confidence and satisfaction in undergraduate nursing students: A pragmatic randomized controlled trial. *Nurse Education in Practice, 70*, 103636-103636. https://doi.org/10.1016/j.nepr.2023.103636	The descriptive factors were assessed, State Trait Anxiety Scale, Perceived Stress Scale, vital signs evaluation form, Student Satisfaction and Self-Confidence in Learning Scale were all administered prior to intervention for study group and prior to simulation training for the control group. The assessments were administered post debriefing as well. Block randomization and blinding were both used in this study to decrease bias.	A pragmatic randomized control trial.	The setting was in a high-fidelity Simulation center of the University in Turkey with 88 undergraduate nursing students that were randomized into the intervention or control group.	The laughing yoga intervention run by the second author who was the only of the researchers to know which group participants were in lasted 40 minutes after all assessments and prior to the simulation training session that both groups attended.	Simulation Based Learning theory discussed.	Laugther yoga reduced perceived stress and anxiety related to simulation based learning. Laugher yoga also increased self-confidence and satisfaction with learning. Laughter yoga was found to enhance vital signs after intervention.	The only potential bias was the second author conducting the laughter yoga.	2a	Included	Well run study with intended population for my purposes.
Luo, X., & Huang, X. (2023). The effects of a yoga intervention on balance and flexibility in female college students during COVID-19: A randomized controlled trial. *PloS One, 18*(3), e0282260-e0282260. https://doi.org/10.1371/journal.pone.0282260	Single limb stance, Rombergs measurement, sit and reach test, and sphis test were used to measure and obtain data. Randomization used to place participants in each group.Participants recruited with a flyer at a school in China.	Randomized control trial study.	Female only students at a school in china with 57 recruited and 40 participating fully, 20 in each group. The mean age of the participants was 20.35. The study took place during the pandemic. Students had no other physical disabilities or previous experience with yoga.	The intervention was 16 weeks of 70 min yoga sessions twice a week by experts in yoga for the experiment group and ten minute sessions twice a week of yoga videos for 16 weeks in the control group.	N/A	The yoga intervention improved balance and flexibility of the students and it was suggested that an onlince yoga class would improve healthy behaviors for this age group during a pandemic.	Potential bias was that only females were recruited.	2a	Excluded	The study do not include any mindfulness, stress, or anxiety scales.
Rose, S., Crutcher, B., Furness, A., & Anderson, E. (2023). Examination of faith-based yoga intervention on perceived stress and coping in college females. *International Journal of Health, Wellness & Society, 13*(1), 119-136. https://doi.org/10.18848/2156-8960/CGP/v13i01/119-136	The Brief COPE assessment, Perceived Stress Scale, and demographic questionnaire were used for this study. Informed consent was given by all participants. IRB approved and SPSS version 28 statistical software analyzed responses.	Randomized control trial study.	Convenience sample of 63 healthy female college students, mean age 18.56,at a small Christian college in western region of United States with 22 participating fully in the control group and 15 in the intervention group.	45 minute yoga sessions two times a week for six weeks using Hatha and Bhakti yoga with an emphasis on biblical scripture and a detailed plan administered by a certified yoga instructor. Control group did not engage in the yoga	N/A	The yoga intervention with scripture was determined to improve psychological wellness in college students. The data supported decrease in stress, decrease in poor coping behaviors such as self-blame denial, and self distraction.	Potential bias is the instructor is an author of the study and was also an active peer of the group of students. The selection of students from a Religious University could have potential bias as well.	2a	Included	This study met target population of college age students and data analyzed with software for results.

Engaging in Research: Reflections from Summer Undergraduate Research Assistants

Elyse Sumarsono, Senior Nursing Student

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Introduction

Research can be intimidating when getting involved as an undergraduate student. Though there were concerns about the expectations and our skillsets, we [Julia & Elyse] applied for this summer research assistant (RA) position and got hired after an interview. Prior to participating in the process of this study, the idea of research brought up emotions of fear and uncertainty. However, there were also feelings of excitement about what we would learn during this new experience. Overall, we thought that participating in this research study would be helpful for our future academic and professional roles, we would be able to learn from the research and apply it to our future education and nursing career.

Beginning the Research

The study was conducted by faculty involving 30 students and data was collected during the spring semester. A descriptive cross-sectional design was utilized with a pre-survey and post-survey data collection method. In our role as RAs, we analyzed and interpreted data following collection and contributed to the written manuscript. The portion of the process we were engaged in was the analysis and write-up on the manuscript. Therefore, the entire process of initially getting started with this research project has been a learning experience. Previously, we learned from a nursing research course about the different study methods; however, the research process that we have been a part of has helped us take the information we have learned and apply it specifically to this. During the initial phase we thought the research was tough, especially working at this level of research since feelings of inadequacy arose. We thought we brought less knowledge and experience to the research team working with PhD students and professors with either their doctorate or masters who have prior experience conducting research. It was intimidating to start working on a research study that seemed above our level, but we were both eager to learn. During the process we learned to ask more questions and to clarify the objectives we were assigned to complete. As undergraduate students we had recent experience working with Microsoft Excel and utilizing this tool to organize data, allowing for effective analysis. Advocating for the skills that we were most confident in ended up benefitting the research

process in a positive way as evidenced by mentor feedback. From the start, we both believed that over time we would learn more skills about the application of different analytical methods including qualitative and quantitative and therefore contribute more to the research study. Some confusion arose when trying to figure out how to complete specific tasks in the research process; however, those challenges prepared us to be proactive and go above and beyond the work we were given. Engaging potential RAs early in the research process such as planning, and data collection will benefit the team and avoid delays. An orienting phase could be utilized to provide a general expectation for roles and deadlines required for each aspect of the position. This would allow for more efficiency and clarity throughout the research process in order to prevent confusion.

Preparation

Our first week working began with online training which went over the fundamentals of research including the steps of setting it up, conducting, and completing a study with human subjects. Through Collaborative Institutional Training Initiative (CITI) training, we learned the importance of confidentiality when conducting human subject research and the many components that are needed to properly conduct human research including considering conflicts of interest. Other educational videos were provided to us by our mentor which included information that helped us learn more about the research analysis process before starting to engage in this specific project. There was communication between the research team, but due to a lack of early engagement and inability to coordinate meetings as a full team there was a delay in the start of data analysis causing problems with individual productivity. Working with another undergraduate student was less intimidating. Also, we recommend other undergraduate students to plan accordingly so that classes do not interfere with research engagement, as this will be stressful.

Engaging in Different Steps of Research

We were able to be engaged in the steps of research after the data collection although we did complete a literature review. Though an earlier literature review was done for this project we were asked to take this step to gain more information on the topic and understand this key step in the research process. We both understood what this entailed, but still needed guidance. When reading articles for the literature review, we found the process of finding sources to use in research very interesting. Our mentor suggested reading an article on how to most effectively

read a research article which provided a lot of insight. An article within the Journal of Oral and Maxillofacial Pathology outlined the scientific approach to selecting and reading a research article (Subramanyam, 2013). This was a helpful tool for us to refine our literature search skills. We learned that when approaching an article, it is best practice to read the title, abstract, and conclusion first before deciding to read the entire article. Then, if those sections seem relevant for the current research, read the whole article.

This process of finding articles for the literature review gave us a better understanding of the study as we did not fully grasp what the research project was about initially. After articles were found that fit the research study, we were expected to read over them and enter them into a spreadsheet. This step in the process we both felt was manageable and we were confident in our skills to perform this assignment. When the articles were all entered into the literature matrix, we were able to organize the articles by themes we found to help us with our next task of writing the literature review section in the manuscript. Based on the information we learned from the literature and from our hands on experience, we found that using tables to organize the information found in each article was the most productive approach to completing the literature search and review. Reviewing videos and articles on how to conduct a literature review and organize it also gives us confidence in performing these tasks.

Data Analysis and Write-Up

The data collected had quantitative and qualitative components. Part of the data was digitally available. Data from hard-copy data sheets were entered into a spreadsheet. We learned how to sort through data and enter it into Excel sheets to make it easier to navigate when trying to draw quantitative and qualitative information efficiently and effectively. We both felt that this aspect of the research process came the easiest to us since our qualifications felt aligned to this area of familiarity. We learned many skills as undergraduate RAs including data analysis methods. Specifically, we learned how to do qualitative coding, and this helped us organize the data by grouping it by similar concepts. Reading the comments and feedback the students gave to their peers and looking for patterns is something we both have never done before; however, we quickly learned and adapted to the process picked up how to work with Excel easier and be efficient in sorting through numerous comments. We consolidated the data from the pre- and post-surveys that were in Excel sheets and created pie charts, then compared the results between the two. The concept maps helped us organize the data as well as have a visual aid to represent

the data more concisely. Making a map was more familiar to us because of our past experiences doing similar tasks.

We had all these documents on the Microsoft Teams site for the research team to access. Our mentor commented that she greatly enjoyed the visual aid we created. This felt like a huge success because we had accomplished something that would be useful. Overall, we became very comfortable taking the data and entering everything into Excel, and condensing it into concept maps, tables, and diagrams. Writing the qualitative data analysis section was easier because we were immersed in the data. We condensed the themes into three major ones and completed the writing. During this three-month process, we met with our mentors multiple times in person and via teams to discuss and set goals. Developing a poster for a potential presentation was also a useful and satisfying part of this experience.

Collaboration

Throughout the research study, we utilized Microsoft Teams to have virtual meetings to discuss everyone's current progress. During these meetings, we went over resources or the current tasks that were delegated to us to work on in the study. These meetings were very helpful in identifying what tasks the other team members were currently doing and how they were working to accomplish them. With the form of communication between the entire team, we were all able to see the research come along together nicely. Also, it was a learning experience when conversing over the virtual meetings as everyone shared the different methods they utilized. It was interesting learning about the levels of measurement and what that meant in our research study. It was also beneficial to learn about the process of cleaning the data as that was a major task we worked on. We critiqued each other's work and clarified doubts or modified maps during these meetings.

Reflections

Engaging in research has encouraged us to get more involved in research unlike before. We have been able to witness and take part in the positive effect that research has on education, and specifically in the nursing field. This experience gave us courage to seek out new opportunities to contribute to research for education and the nursing profession. Volunteering in any capacity with nursing professionals in the hospital or university setting is a great way to start. After graduation, we plan to be intentional to ask the right questions which can spark

conversations on research topics. Such activities may be essential to initiate plans for innovative solutions.

We challenge nursing students to participate in research and not to be afraid. You may feel overwhelmed initially, but it can be learned if you have the right mindset. As undergraduate RAs, we experienced learning firsthand through actively trying tasks we never had completed or knew how to do. We took this opportunity to participate in the process of research, work with a team, and learn as much as we could through every task we were delegated. As much as research may sound intimidating, it provided us with the chance to discover how to approach research as undergraduate students and how to encourage others to participate in future research. We were able to overcome the barrier of intimidation in this higher-level research by advocating for our skillsets and relying on each other for support.

The most important advice we believe we could give to other students who are thinking about participating in research is to not be afraid to ask questions. Throughout our time working as research assistants, we often felt unqualified to do the tasks we were working on since we were collaborating alongside much more experienced professionals. As a result of our perceived intimidation due to our lack of experience, we struggled on multiple occasions with completing tasks that were designated to us. We could have gained a lot more insight, instruction, and guidance had we asked all the questions we had to our mentors. It is always good to have a partner so that you get mutual support. Starting at the same time with the other team member also would have been helpful. Because of the delayed start, the second person had to do a lot of catch-up, which was felt as a frustration. Using each other as resources for guidance and critique helped us overcome the communication barrier to complete tasks efficiently despite scheduling conflicts. We felt the experience was productive because we received great insight into the research process, as well as accomplished authorship in a publication and presentation.

Conclusion

This research study enabled us to experience firsthand the process of conducting research working with experienced professionals. Our experience initially brought up feelings of uncertainty, however, by the end of the study we were excited about the learning that we could share with others. Through this process, we were able to not only learn about how to conduct research, but we were also able to take away important insight about the research topic of peer feedback. We found that we can apply the findings from the study to our own education and

future professional careers as nurses. This includes using peer feedback to enhance our bedside skills, learn new methods from coworkers in the clinical setting, and make plans for improvement in our professional careers. Overall, we hope that our reflections during our time as undergraduate research assistants can help change the negative stigma of student participation in research and encourage participation in future research. Additionally, becoming a coauthor in a manuscript and developing a poster to present at future conferences was rewarding as well.

References

Subramanyam, R.V. (2013). Art of reading a journal article: Methodically and effectively. *Journal of Oral and Maxillofacial Pathology. 17*(1), 65-70. https://doi.org/10.4103/0973-029X.110733

Comparison of Post Discharge Telephone Call Methods and Their Impact on Patient Outcomes and Satisfaction: An Integrative Review

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Abstract

Background: Discharge planning and education may directly influence patient outcomes, including patient satisfaction and readmission rates. Discharge processes and follow-up vary across departments and facilities. Follow-up telephone calls after patient discharge are commonly utilized; however, delivery techniques differ across healthcare areas. The purpose of this integrative review is to explore the various techniques of initiating post-discharge follow-up phone calls and their impact on patient outcomes and satisfaction. **Method:** A literature search across different Databases and the search engine Google Scholar yielded over 2,751 articles utilizing the Boolean phrases: (*follow up* or *follow-up* or *post-discharge* or *following discharge* or *discharge*) AND (*techniques* or *methods* or *strategies* or *interventions*) AND (*patient safety* or *patient outcomes* or *quality of care*) AND *telephone follow up*. Other search phrases included *follow up phone call methods* and Re-Engineered Discharge (*RED) discharge toolkit*. A final total of 22 studies were chosen for evaluation and analysis. **Results:** Methods examined were, calls by a registered nurse/advanced practice nurse or trained nonmedical personnel, communication via an automated short messaging system (SMS), and scripted or non-scripted methodology, with patient outcomes measured according to patient satisfaction and readmission rates. A literature review indicated that scripting may be beneficial for all follow-up methods. Calls from nonmedical staff and SMS/automated messages can supplement nurse-led follow-up. **Conclusion:** Improvement was found with post-discharge follow-up; however, no consistent findings indicate one follow-up method is more beneficial than another. Therefore, the impact of the various methods on healthcare costs should be considered when seeking the best practice.

Keywords: follow-up, post-discharge, techniques/methods, telephone follow-up, SMS/automated messaging, RED discharge toolkit, patient outcomes, readmission rates

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Comparison of Post Discharge Telephone Call Methods and Their Impact on Patient Outcomes and Satisfaction: An Integrative Review

Discharge planning and education is defined as a transition of care, typically occurring following hospital/emergency department (ED) admission, outpatient procedure or inpatient units to home or a skilled facility (Patel & Bechmann, 2022). Discharge planning and education may directly influence patient outcomes, including critical measures such as patient satisfaction

and readmission rates. Follow-up methods after patient discharge vary. However, using a telephone call for discharge follow-up is touted as an effective method to manage patient needs, reduce readmissions, and improve patient satisfaction and approval ratings (Woods et al., 2019). Telephone follow-up calls have also proven effective in improving patient adherence to discharge instructions and attendance at scheduled follow-up appointments (Luciani-McGillivray et al., 2020). Despite post-discharge telephone follow-up calls being commonly utilized, delivery techniques differ across healthcare areas (Coffey et al., 2019). Techniques include non-scripted calls and using a discharge script such as the Re-Engineered Discharge (RED) toolkit developed by the Agency for Healthcare Research and Quality (AHRQ, 2013). The Agency for Healthcare Research and Quality designed the RED toolkit to effectively prepare the patient for discharge and support the patient following discharge to improve patient outcomes by reducing readmission rates and improving patient satisfaction. This toolkit prescribes a follow-up call initiated 48 hours following patient discharge utilizing a scripted approach. Telephone follow-up strategies also vary by the type of individual who initiated the call. Calls may be made by a registered nurse/advanced practice nurse (RN/APRN) or nonmedical personnel, or a message may be sent by an automated message or short messaging system (SMS). While there are different methods for administering a post-discharge telephone follow-up, evidence for the best approach is unknown.

The Problem of Unplanned Readmission and Cost

Ineffective discharge planning, insufficient education, and lack of follow-up are associated with poor patient outcomes, including decreased patient satisfaction ratings and increased readmission rates (Kim et al., 2021). Specifically, one-fifth of Medicare-coded hospital 30-day readmissions are attributed to ineffective discharge planning and follow-up (Beauvais et al., 2022; Mitchell, 2022). Such outcomes and readmissions create problems and concerns for the patient but also result in increased strain on and costs to the health care system.

It is estimated that the average hospital readmission costs a healthcare facility approximately $15,200 (Beauvais et al., 2022). National readmission rates average over 14%, representing a significant need for improvement and reduction or readmissions. Healthcare facilities use ED and hospital readmission rates as a quality indicator (van Loon-van Gaalen et al., 2021). The Hospital Readmission Reduction Program, developed by the Centers for Medicare and Medicaid Services (2023), focuses on effective discharge planning and patient

engagement to reduce unplanned readmissions in specific patients. The Hospital Readmission Reduction Program influences hospital reimbursement and has the potential to result in a 3% reduction in payment related to 30-day readmission rates within a performance period. The average cost per readmission and the impact of patient readmissions on hospital reimbursement rates create a critical need to reduce such occurrences.

Ultimately, patient readmissions increase demand on hospital staff, add to an often already taxed patient census, and impact hospital reimbursement, thus increasing health care costs. Poor patient outcomes, such as sentinel events following discharge and poor patient satisfaction ratings, may also expose the healthcare facility and its care providers to litigation in extreme circumstances and negatively influence public perceptions and community, state, and federal support. Specifically, The Centers for Medicare and Medicaid Services (2023) collect and publish data regarding patient outcomes, including 30-day readmission rates, mortality rates, and patient experience ratings, for transparency with consumers and accountability for healthcare facilities.

The purpose of this integrative review is to explore the various techniques of initiating post-discharge follow-up phone calls and their impact on patient readmission outcomes and satisfaction following discharge from a hospital. The findings from this review may help inform current clinical practice to improve discharge processes and follow-up methods and promote positive patient outcomes.

The clinical question of focus is, “What methods and processes are used for post-discharge follow-up telephone calls, and what is their impact on patient satisfaction?” A subsequent question of interest is, “Is there a relationship between the method of follow-up telephone calls and patient outcomes?”

Method

For this review, the term ‘telephone follow-up call’ is defined as a method used to contact a patient after discharge. The calls by a registered nurse/advanced practice nurse or trained nonmedical personnel, communication via an automated short messaging system (SMS), and scripted or non-scripted methodology were included in the literature review. Patient outcomes are evaluated based on patients' satisfaction rates and the frequency of readmissions.

Search Terms, Databases, and Inclusion and Exclusion Criteria

The following keywords were used for the search: (*follow up* or *follow-up* or *post discharge* or *following discharge* or *discharge*) AND (*techniques* or *methods* or *strategies* or *interventions*) AND (*patient safety* or *patient outcomes* or *quality of care*) AND *telephone follow-up*. Google Scholar was also utilized for the literature search. Search phrases used in Google Scholar included *follow-up phone call methods* and the *RED discharge toolkit*.

Databases such as CINAHL, PubMed, ProQuest, and MEDLINE were accessed for the literature search. The search engine Google Scholar was also used to retrieve publications. Liberty University's Jerry Falwell Library was utilized for interlibrary loans to obtain articles with limited access through the primary database search.

Studies were included if they: (1) were published in English between 2019 and 2023, (2) involved adult participants, (3) utilized an RN, APRN, or SMS for follow-up contact, (4) used scripted follow-up methods, and (5) measured patient satisfaction or readmission rates as outcomes. The initial search yielded over 2,751 articles subsequently narrowed by full-text articles from peer-reviewed journals, written in English, and published between 2019 and 2023. Unpublished manuscripts and abstracts were eliminated. This search resulted in a total of 81 articles. Articles were then sorted based on topical relevance utilizing keywords and phrases such as *nurse-driven*, *non-medical personnel*, *telephone or SMS follow-up*, and *RED toolkit*. Studies involving physicians or other health professionals, such as pharmacists, were also excluded. Duplicate articles and studies with inconclusive findings were eliminated. A quality appraisal was performed based on informational significance and representation of current data (Whittemore & Knafl, 2005).

Conceptual Framework

According to Whittemore and Knafl (2005), developing a clearly defined topic of interest is critical to the overall success of the integrative review. The conceptual framework for an integrative review consists of problem identification, a literature search, data evaluation and analysis, and presentation of review findings (Whittemore & Knafl, 2005). This review was conducted using this framework.

A total of 22 articles were chosen for evaluation and analysis. A thematic analysis was conducted on the selected articles to identify strategies commonly utilized in patient telephone follow-up following hospital discharge. These consisted of calls made by nurses or trained

nonmedical personnel or a standardized messaging telephone follow-up, and the use of a script. Studies were also analyzed for outcomes related to patient satisfaction or hospital/ED readmission rates.

Toronto and Remington (2020) defined bias as "anything that systematically or predictably distorts the results of a study" (p. 46). Bias may occur throughout the various stages of research and has the potential to alter results and skew findings. The 22 articles utilized in this integrative review were evaluated for potential bias and study limitations, as seen in the Evidence Table in Appendix A. Studies demonstrating strong potential bias were excluded from this integrative review. The type of study, level of evidence, and relevance to this review are listed in detail in the Evidence Table found in Appendix A.

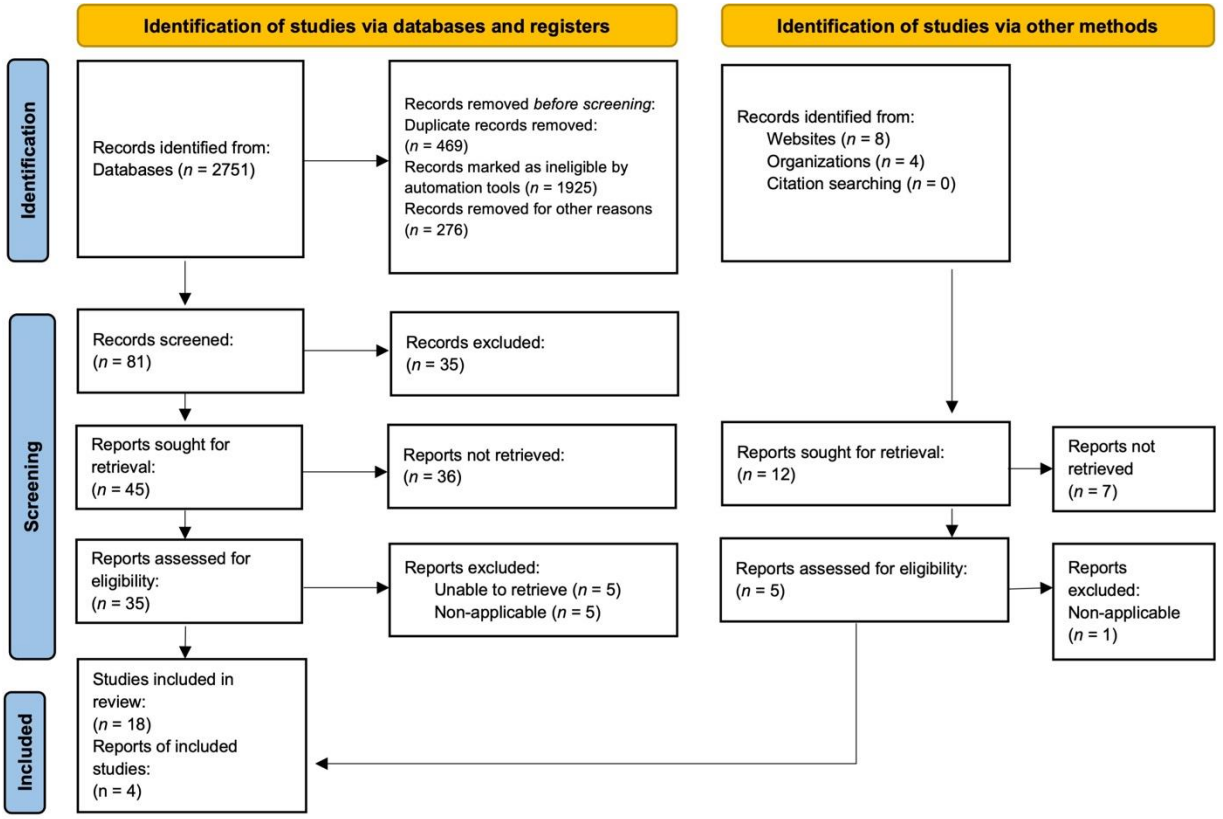
Melnyk's levels of evidence hierarchy were utilized as an appraisal tool (see Appendix B). Levels of evidence range from Level 1 to Level 7, with levels decreasing in number as study strength increases (University of Michigan Library, 2022). Studies chosen for this review range from Level 6 to Level 1. Seven studies are descriptive or qualitative, categorized as Level 6. Two studies are mixed-study systematic reviews, ranking at ~~a~~ Level 5. Eight studies are quasi-experimental in nature or control trials without randomization, or Level 3. Four studies are randomized control studies, ranking at Level 2. One study is a systematic review of randomized control studies, classified as the highest level of evidence, Level 1, based on Melnyk's hierarchy. Data were reviewed not only for the level of evidence but also for how they pertained to the clinical question. Data were not excluded based on the level of evidence; however, six articles were excluded due to lack of relevance. As recommended by Whittemore and Knafl (2005), the PRISMA flow chart developed by Page et al. (2021) was used to depict the literature search and data reduction process in Figure 1 below.

Findings/Results

A thematic analysis was conducted to identify various techniques commonly utilized in patient follow-up. The themes identified included nurse-driven follow-up, follow-up by trained nonmedical personnel, standardized messaging telephone follow-up, and utilization of scripted and non-scripted techniques. For inclusion in this review, studies were required to include outcomes related to patient satisfaction or readmission (hospital or ED) rates. This inclusion criteria ensured that the studies obtained were relevant to the clinical question posed for this review.

Figure 1

PRISMA Flow diagram



Note. Adapted from "The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews," by M. J. Page, J. E. McKenzie, P. M. Bossuyt, I. Boutron, T. C. Hoffmann, C. D. Mulrow, L. Shamseer, J. M. Tetzlaff, E. A. Akl, S. E. Brennan, R. Chou, J. Glanville, J. M. Grimshaw, A. Hrobjartsson, M. M. Lalu, T. Li, E. W. Loder, E. Mayo-Wilson, S. McDonald, . . . Moher, D. 2021, *BMJ*, *372*(71). https://doi.org/10.1136/bmj.n71

Nurse-Driven Follow-Up

For this review, a nurse-driven follow-up phone call is defined as a call made by a nurse such as an RN or APRN. The follow-up phone call after patient discharge is associated with a greater degree of patient compliance with discharge instructions when compared to no follow-up, regardless of the degree of education provided to the patient prior to discharge (Aloy-Prósper et al., 2020). Nurses are traditionally familiar with the typical experiences of patients discharged across various units, following certain procedures, treatments, and specific diagnoses (Chen et al., 2021). Therefore, RNs and APRNs can readily and effectively assess and address the patient's needs (Bressman et al., 2022; Chen et al., 2021; Du et al., 2021; Luciani-McGillivray et al., 2020; Mitchell, 2022; Tomlinson et al., 2020; van Loon-van Gaalen et al., 2021).

The technique of a nurse-driven follow-up call also varied in terms of what type of nurse administered the call. Nurses making follow-up calls included APRNs, acute care RNs, nurse navigators, and primary care nurses directly or indirectly involved in the patient's hospital stay. The literature identified an increased patient satisfaction in having a nurse directly involved with the patient's care at the hospital administer the follow-up phone call. This benefit was noted from both a provider and patient perspective in the study conducted by Chen et al. (2021), and this finding correlates with similar findings by Hoyer et al. (2021) and Mitchell (2022).

Impact on facility costs and return on investment were also identified across various studies because of nurse-driven follow-up calls (Chen et al., 2021; Gardner et al., 2020). Follow-up calls are reimbursable to hospital facilities; these funds aid in staffing nurses or APRNs to provide such follow-up care (Chen et al., 2021). The study conducted by Gardner et al. (2020) also demonstrated significant cost savings when RNs did the follow-up call.

Trained Nonmedical Personnel

Another follow-up strategy identified is using trained nonmedical personnel to administer the follow-up phone call. Luciani-McGillivray et al. (2020) examined follow-up phone calls 72–96 hours post-discharge by trained nonmedical personnel following an initial nurse-driven follow-up call. The nonmedical personnel consisted of hospital volunteers trained to deliver these scripted follow-up calls. These personnel worked as a team along with the nurses who initiated the follow-up calls regarding scheduling conflicts or issues requiring attention by medical personnel. Implementing the calls by nonmedical personnel improved follow-up attainment rates to 65.5% from 48.6% when only the initial nurse-driven post-discharge follow-up call was implemented (Luciani-McGillivray et al., 2020). This indicates that a second follow-up call was beneficial.

Hendrickson et al. (2020) implemented a similar model with the initiation of a scripted follow-up call by a trained nonmedical trauma recovery coach between three and five days following patient discharge. The trained nonmedical personnel are also helpful in reiterating resources available to the patient, providing a reminder to obtain resources, or maintaining a discharge follow-up appointment either with a specialty or primary care provider via follow-up call (Hendrickson et al., 2020; Kim et al., 2021; Luciani-McGillivray et al., 2020). Using trained nonmedical personnel can increase the frequency of calls to patients and reserve nursing

attention for patients requiring assistance from a licensed healthcare professional (Luciani-McGillivray et al., 2020).

SMS and Automated Message Service

Another follow-up technique is sending a short message or an automated message service. Bressman et al. (2022) examined the delivery of a scripted follow-up call within 48 hours of discharge, followed by an SMS check-in over a 30-day period on a tapering schedule. Patient responses were directly linked with the electronic medical record and prompted nursing staff to complete a telephone follow-up based on patient response as needed. Only 8.6% of participants opted out of the program before the 30-day mark. Hallet et al. (2020) and Leconte et al. (2019) conducted similar studies, in which an SMS was used for follow-up with surgical patients. In both studies, an SMS was used as the initial attempt for contact. However, a lack of response necessitated a follow-up nurse phone call. In Hallet et al.'s (2020) study, 59% of patients responded to the initial SMS message, with 76% of the intervention group responding by the first post-op day. A similar success rate of 75% was achieved with the utilization of an automated call in a study by Harrison et al. (2020), and a success rate of 87% was attained with a standardized text message in a study by Leconte et al. (2019). A report of pain triggered a nurse-driven follow-up call, as demonstrated in similar studies utilizing other techniques (Bressman et al., 2022; Hallet et al., 2020; Harrison et al., 2022; Leconte et al., 2019; Luciani-McGillivray et al., 2020). The patient's age was correlated with a need for more calls; those over 65 needed more calls (Hallet et al., 2020; Harrison et al., 2022; Leconte et al., 2019).

Scripted Methodology

Telephone follow-up methods may use a scripted technique. Multiple studies demonstrated that individuals performing follow-up calls often experienced barriers to performing a follow-up call in a timely and targeted manner related to specific topics, overshadowing other concerns (Chen et al., 2021; Mwachiro et al., 2019). Chen et al. (2021) identified that medical staff desire to implement a standardized pain assessment protocol. Medical staff also noted that having a template of questions or topics to address during the follow-up call aided their ability to deliver an effective patient follow-up (Chen et al., 2021). The authors speculated that a standardized interview template, specifically for pain assessments, provided consistent information across various clinical settings that benefitted the patients and staff.

The studies conducted by Bressman et al. (2022) and Hendrickson et al. (2020) involved delivering one scripted post-discharge follow-up call within 48 hours and another within 3 to 5 days of discharge. The scripts utilized in the selected studies are similar, consisting of questions addressing the patient's pain and physical status, whether the pain had questions or concerns regarding discharge instructions and follow-up appointment scheduling (Bressman et al., 2022; Chen et al., 2021; Hendrickson et al., 2020). Du et al. (2021) implemented a Project RED intervention specifically designed for surgical patients (RED-S). This discharge bundle included pre-discharge patient education, care plan development, and post-discharge planning and follow-up. Depending on whether the patient had a primary care provider, this intervention included a scripted follow-up call administered by a primary care or surgical clinic nurse.

Non-scripted Methodology

For this review, identifying studies specifically utilizing a non-scripted technique was difficult. Following various searches for scholarly literature across numerous databases, it was noted that a non-scripted phone call is a less explored area. Most follow-up calls involved some form of scripting or a questionnaire to direct the conversation.

Discussion

Twenty-two articles were examined to identify strategies commonly used in patient telephone follow-up following hospital discharge. These were then analyzed to determine the existence of a correlation between the follow-up technique with patient satisfaction rates and patient readmission rates as outcomes. Identifying-relationships between follow-up practices and patient outcomes is critical to ensuring best practices and promoting organizational success.

Patient Satisfaction Rates

For this review, patient satisfaction is defined as positive patient feedback obtained through qualitative data collection methods. Patient satisfaction rates are a key quality indicator. Many studies noted that patients were pleased to receive a formal follow-up call (Chen et al., 2021; Luciani-McGillivray et al., 2020; Woods et al., 2019). Results also demonstrated that patients who experienced the RED-S intervention consisting of pre- and post-discharge education along with a post-discharge follow-up phone call gave more positive feedback regarding their discharge experience compared to the patients who received traditional discharge instructions and follow-up (Du et al., 2021; Mitchell, 2022). In one study, the average patient satisfaction score regarding discharge was 8.56 out of 10, with a standard deviation of 1.93 after

implementing a RED toolkit discharge and follow-up technique (Mitchell, 2022). The overall patient satisfaction rate increased from 33% preintervention to 59.2% postintervention.

On comparing the effect of different strategies on patient satisfaction, Hallet et al. (2020) found no significant difference in patient satisfaction rates when comparing a nurse-driven follow-up call to an SMS follow-up. Similarly, no difference was noted in patient satisfaction rates when patients did not receive a follow-up call ~~as~~ compared to receiving a post-op follow up call from nonmedical personnel (Kim et al., 2021). Ooi et al. (2021) had similar findings in the early post-discharge phase; however, telephone follow-up calls provided in the 90–100-day post-discharge phase were associated with increased patient satisfaction rates ~~as~~ compared to an automated message. Berardinelli and Bernhofer (2020) reported no difference in patient confidence levels when comparing the receipt of initial instructions at the time of discharge to a follow-up phone call that used a template.

Hospital Readmission Rates

Hospital readmission rates are another primary focus of healthcare organizations due to their impact on reimbursement rates, patient census, and staffing demands. In a study conducted by Luciani-McGillivray et al. (2020), a nurse-driven follow-up phone call delivered within 24 to 48 hours of ED discharge decreased 7-day revisit rates from 8.6% to 4.5% ($p < 0.001$). Coffey et al.'s (2019) systematic review revealed significant evidence demonstrating that patient education, specifically when delivered via a nurse-driven follow-up call, was directly correlated with reduced hospital readmission rates. This systematic review also found that reduced readmission rates correlated with the implementation of electronic discharge systems administered by the acute and primary care settings. Lovasik et al. (2020) and Mwachiro et al. (2019) found similar results, as in these studies, 30-day readmission rates decreased significantly following the implementation of an APRN-driven follow-up intervention. Woods et al.'s (2019) systematic review noted discrepancies in such correlations across various studies. Depending on the study strength and the readmission period studied, a more significant impact was made on readmission rates during the more acute period than readmissions after 30 or more days. van Loon-van Gaalen et al. (2021) also demonstrated no distinct differences in 30-day hospital/ED readmission rates in elderly patients greater than 70 years old receiving a nurse-driven follow-up call following discharge from the ED as compared to those receiving a scripted patient satisfaction survey.

The RED toolkit was used for patient follow-up post-discharge. Gardner et al. (2020) determined that patients at facilities that utilized a RED discharge technique had a 1.7% lower average 30-day readmission rate compared to a control group without access to this discharge technique. Additionally, 60-day and 90-day readmission rates were lower for the intervention group by 2% and 0.8%, respectively. The readmission rates in facilities where the RED toolkit was implemented also decreased following the implementation of this strategy. These findings support those of Mitchell (2022), whose study found that only one out of 30 patients (3.3%) experienced a 30-day readmission. Similarly, following the implementation of the RED toolkit discharge and follow-up, only one participant had an ED visit within 30 days post-discharge.

The impact of the application of an extended SMS follow-up intervention was also identified in one study. This intervention resulted in a 41% reduction of acute care utilization within 30 days post-discharge at the intervention practice compared to the control practice (p = 0.02; Bressman et al., 2022). At the intervention practice, ED readmission decreased from 20.3% to 16.5% following the intervention. The odds of 30-day readmission were 55% lower at the intervention practice (p = 0.01).

The literature consistently identifies factors impacting readmission rates and barriers to receiving follow-up interventions. Hoyer et al. (2021) identified factors such as older age, male gender, Black race, and lower socioeconomic status, which are associated with higher 30-day and higher anticipated readmission rates. Black race, lower socioeconomic status, and higher readmission risk revealed barriers to receiving various prevention interventions such as ~~a~~ follow-up telephone contact (Hallet et al., 2020; Hendrickson et al., 2020; Hoyer et al., 2021).

Overall, improvement was found with post-discharge telephone follow-up compared to no follow-up. This finding was specifically true regarding patient readmission rates. However, there are no consistent findings that one follow-up method is more beneficial than another regarding patient readmission outcomes or satisfaction rates.

Limitations

Some limitations of this review include the need for more research about the utilization and impact of SMS and automated message systems on post-discharge follow-up. This lack of information and research predisposes the findings of this review to bias related to this specific topic. Two of the articles in this review, both randomized control studies, also presented conflicting information regarding the impact of nurse-driven telephone follow-up on patient

readmission rates, specifically 30-day readmission rates. Although it utilizes a standardized follow-up call, the RED discharge technique also involves other evidence-based follow-up techniques such as pre-discharge education, care plan development, and medication reconciliation, with little information in the literature as to which of these interventions makes the greatest impact. Despite a lack of variation amongst follow-up techniques as related to overall patient satisfaction scores, provision of resources, increased discharge instruction compliance, and reduction of discharge anxiety are consistent themes resulting from efficient and effective patient discharge (Chen et al., 2021; Du et al., 2021; Kim et al., 2021; Ramalingam et al., 2022; Woods et al., 2019). Another primary limitation of this review is the need for more information and research related to non-scripted methodologies. An extensive literature review determined that the term *non-scripted* is not an area that is researched. Ultimately, there are no identifiable data related to this technique in post-discharge patient follow-up.

Another primary area of focus is the impact of age, race, and various social determinants on post-discharge care and follow-up. These factors may influence follow-up success and readmission rates (Hallet et al., 2020; Hendrickson et al., 2020; Hoyer et al., 2021). Such information demonstrates a need for healthcare facilities to identify and account for such factors when creating discharge plans and follow-up care. Stratifying findings based on the patient's primary language was not discussed in this review. These factors also pose a unique problem for facilities seeking to standardize discharge follow-up for efficiency while providing patient-centered discharge follow-up for efficacy.

Additionally, this review is conducted by one reviewer. Using multiple reviewers may enhance the interrater reliability of the findings drawn from this review. Publications in languages other than English were not included in this review, limiting the cross-cultural applicability of the findings and the responses by those families when a call is initiated. Language barriers between the caller and recipient may result in not answering or not returning the call.

Implications for Practice/Future Work

Techniques such as nonmedical personnel and SMS follow-up may act as beneficial adjuncts to traditional nurse-driven follow-up. Supplementation of a nurse-driven follow-up program with a scripted technique at 24–48 hours post-discharge along with SMS or trained nonmedical personnel’s extended follow-up may be best practice to reduce readmissions,

improve patient satisfaction, and reduce costs. Further research should also be conducted into the benefits of this technique as it relates not only to patient outcomes but also to health care costs.

Specific care should also be considered for health equity in future research related to post-discharge patient follow-up. Some studies suggest direct correlations between specific ages, races, and other social demographics and patient follow-up success. Further research should be conducted to identify follow-up techniques most effective in these at-risk populations. The cultural and linguistic competencies of the caller in congruence with patients should also be examined to ensure ethnic equality and access amongst diverse patient groups.

Conclusion

The literature was examined for association of the use of different modalities of telephone follow-up, including calls by a registered nurse/advanced practice nurse, or trained nonmedical personnel, communication via automated short messaging system (SMS), and scripted or unscripted methodology, with patient outcomes measured according to patient satisfaction and readmission rates. This analysis found that scripted phone calls may benefit all follow-up calls but are seemingly necessary for nonmedical personnel. Evidence also showed that ultimately, nonmedical personnel and SMS/automated messaging follow-up techniques may act as cost- and time-effective adjuncts to the traditional nurse-driven follow-up. The literature further indicated that using SMS or trained nonmedical personnel could assist in preserving the time of nurses and APRNs to address medical follow-up problems rather than issues such as insurance and other nonmedical problems. Despite the lack of variation amongst techniques related to their overall impact on patient satisfaction scores, provision of resources, increased discharge instruction compliance, and reduced discharge anxiety are consistent outcomes resulting from efficient and effective patient discharge.

Regarding patient outcomes, improvement was found with post-discharge follow-up; however, there are no consistent findings that one follow-up method is more beneficial than another. Therefore, the impact of the various methods on healthcare costs should be considered when seeking to identify the best practices. Follow-up methods must also account for health equity and may need to be personalized to each patient.

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Kangaroo Care and Improved Physiological Status in Preterm Infants

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Introduction

As preterm births worldwide continue to cause long-term sequelae for infants, it is imperative to implement interventions that promote better outcomes. Kangaroo care (KC), a simple yet meaningful intervention for both infants and their parents, is cost-effective and it requires only time and diligent monitoring. KC while a common practice with full-term newborns and their mothers or fathers, can be implemented safely for preterm babies. This practice needs more attention and emphasis to be normalized in the neonatal intensive care unit (NICU).

Background

KC, often called skin-to-skin contact (SSC), was first practiced in 1978 in an overcrowded NICU in Bogota, Colombia. The practice was intended for use with preterm infants born before 37 weeks of gestational age or with a birth weight under 2500 grams (Pados & Hess, 2020). This practice was started by a pediatrician and professor, Dr. Rey-Sanabria, and became standard in Colombia and then abroad with the help of the Kangaroo Foundation (Pados & Hess, 2020). According to the World Health Organization (2021), over 15 million babies are born preterm (before 37 weeks of gestational age) every year. Studies have shown the benefits of KC on preterm outcomes. It is prudent to continue to assess these benefits and address barriers to implementing this care.

Purpose

According to the World Health Organization (2021), every year, an estimated 15 million babies are born preterm. Complications from preterm births are the leading cause of death among children under five years of age, resulting in approximately 1 million deaths. Three-quarters of

these deaths could be prevented with currently known interventions. KC is a proven, cost-effective way to improve physiological outcomes for preterm infants.

This integrative review examined the association between KC and improved physiological status in preterm infants under 34 weeks of gestational age. This population was selected due to the gestational age cutoff for NICU admission, medical complexity, and physiological benefits. This integrative review aims to determine if KC has positive physiological effects on preterm infants in the NICU. Another goal of this review is to examine the barriers to implementing KC and ways to overcome these barriers.

Research Question

Does KC have positive physiological effects on preterm infants, less than 34 weeks gestational age, in the NICU?

Methods

The samples utilized in the literature review included preterm infants born at less than 34 weeks gestational age who were clinically stable enough to receive KC from their mothers in the NICU. Studies included sample sizes of 10–1,461 infants; the setting of each study included a single NICU and up to 11 NICUs. Gestational ages ranged from 22 weeks to 34 weeks, with birth weights ranging from 370 grams to 1,410 grams.

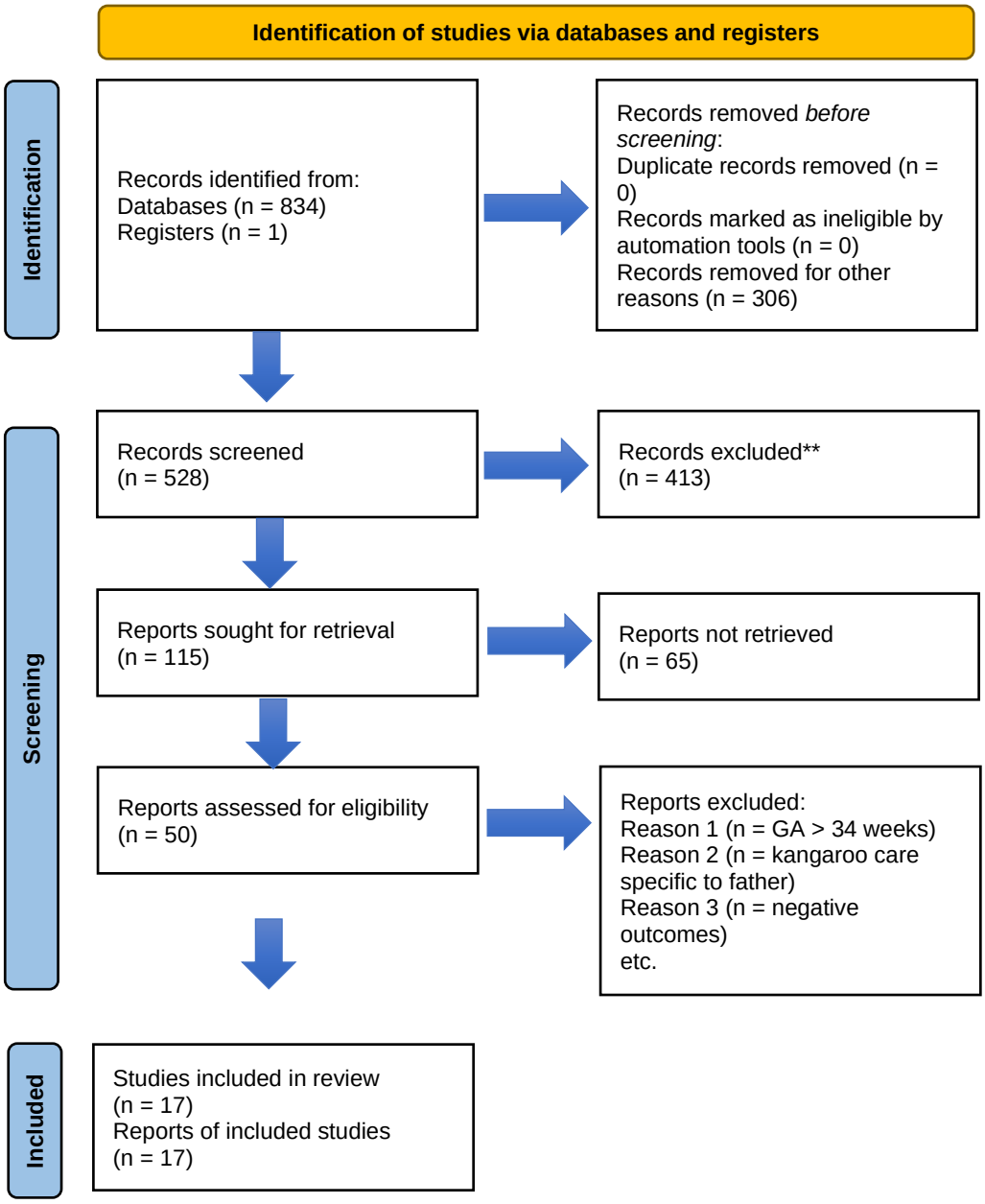
The inclusion criteria for this integrative review consist of publications on preterm infants born before 34 weeks of gestational age admitted to the NICU. Exclusion criteria included publications on infants with gestational age greater than 34 weeks, infants with congenital anomalies, infants requiring surgery, or those on sedation or analgesia (Hurley & Harrison, 2020).

Search terms such as neonatal intensive care unit, NICU, kangaroo care, benefits, preterm infant, and physiological status were used to retrieve peer-reviewed publications. Databases used include Medline, BioMed, and Pro Quest. Of the 834 articles initially found, this was narrowed down to 528, and later to 115. Finally, 17 of the most pertinent articles were used for this integrative review.

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework was utilized for this integrative review (Figure 1). The Whittemore and Knafl methodology was utilized to analyze articles through problem identification, literature search, data evaluation, data analysis, and presentation.

Figure 1

PRISMA Flow Diagram



Results

The number of articles reviewed was 17 peer-reviewed articles. Of these articles, five are Melnyk's Level 1 (systematic reviews), two are Melnyk's Level 2 (RCT), one is Melnyk's Level 4 (cohort study), four are Melnyk's Level 5 (review of qualitative studies), three are Melnyk's Level 6 (single descriptive), and two are Melnyk's Level 7 (expert opinion).

The integrative literature review revealed five themes related to the positive effects of KC on preterm infant outcomes and barriers to implementing this care. The themes identified to support KC in preterm infants included reducing pain, improving growth, increasing oxytocin, and lowering heart rate. The final theme addressed the barriers to implementing KC. Common barriers to providing KC included environment, provider beliefs, practice variation, and parent presence.

Kangaroo Care and Preterm Infant Outcomes

The literature review found strong evidence supporting the positive relationship between KC and improved preterm infant outcomes. These outcomes have been examined, and the positive physiological outcomes seen in preterm infants when KC is utilized prompt further investigation. Physiological outcomes include reduced pain, increased growth, increased oxytocin levels, and decreased heart rate.

Kangaroo Care and Pain

KC can be an effective intervention to reduce neonatal pain. Hurley and Harrison (2020) found that KC is as effective in reducing pain in preterm neonates during painful procedures as 24% sucrose. The study highlighted no added benefit to using both KC and sucrose; KC should be considered an alternative to sucrose (Hurley & Harrison, 2020). A meta-analysis found that kangaroo mother care (KMC) significantly benefits pain reduction over standard care (Sharma & Ruikar, 2022). According to this study, neonates in the NICU receive an average of 10 pain-inducing procedures, and 79% of them are without any analgesia. KMC is an important intervention in reducing procedural pain in infants due to its advantages over standard care (Sharma & Ruikar, 2022).

Kangaroo Care and Preterm Infant Growth

Preterm infant growth can be affected by KMC and its duration of use. Charpak et al. (2021) studied the effects of KMC on growth in preterm infants and found that the duration of KC was directly related to growth. Weight gain was higher when the duration of KC was at least

8 hours per day (Charpak et al., 2021). Orahood (2021) posited that KC improves mortality rates, promotes a better sleep-wake cycle, leads to fewer incidents of infections, and promotes increased weight gain in infants. KMC should be initiated as soon as possible and for as long as possible to promote preterm infant and low birth weight infant growth (Charpak et al., 2021). A systematic review by Chan et al. (2016) found that KMC, compared to conventional care, is more effective, reduces the risk of hypothermia and illness, shortens the length of NICU stay, and improves growth, breastfeeding, and attachment. Interestingly, the benefits of KMC remained 20 years later in infants who were studied, and long-term social and behavioral improvements were identified (Stockwell, 2017). Although these findings were seen in infants who received KMC as low birth weight infants, the limitations exist in that many of the positive changes were small and not directly attributable to KMC (Stockwell, 2017).

Skin-to-Skin Contact and Oxytocin

As seen in one study, SSC can raise oxytocin levels in infants and ~~in~~ parents. Vittner et al. (2018) examined the relationship between SSC and oxytocin levels in the mother, father, and infant. Results of this study showed salivary oxytocin levels increased significantly during SSC for mothers, fathers, and infants, indicating a release of oxytocin during SSC. This study indicates that SSC can effectively reduce parent and infant stress in the NICU (Vittner et al., 2018). Pados and Hess (2020) studied the effects of SSC on short-term physiologic stress outcomes in preterm infants in the NICU. They found that SSC improves short-term cardiorespiratory stress outcomes and strong evidence that SSC reduces cortisol and increases oxytocin levels in preterm infants (Pados & Hess, 2020).

Preterm Infant Heart Rate and Kangaroo Care

Ludwig et al. (2021) studied preterm infant heart rates during a Family Nurture Intervention consisting of, on average, four 1-hour SSC sessions per week. Results showed a significantly lower heart rate in the Family Nurture Intervention group than controls (Ludwig et al., 2021). Cristóbal Cañadas et al. (2022) studied the effects of KMC on the physiological stress parameters of premature infants. The authors found that infants who received KMC had a higher mean heart rate, oxygen saturation, and temperature; however, the results were not statistically significant (Cristóbal Cañadas et al., 2022). Vogl et al. (2021) examined the effects of KMC and kangaroo father care (KFC) on preterm infant heart rate, periodic breathing, and apnea. The results showed a significant difference between heart rate variability pre-KC and during KC,

with no significant difference in the number of apneas but a trend toward reduced periodic breathing (Vogl et al., 2021).

Quality Improvement and Kangaroo Care

Several factors were reported as reasons for the lack of utilization of KC, and the barriers to its implementation were studied. Nation et al. (2021) studied a quality improvement project designed to increase SSC for infants born before 29 weeks of gestation. The study examined barriers to implementation, including medical complexity and staff misconceptions. Pre- and post-surveys were utilized to evaluate comfort level with SSC and perceived barriers to its use. The quality improvement project included an updated unit-specific SSC protocol and education tailored to identified barriers (Nation et al., 2021). The study found a statistically significant increase in nurses' comfort level when utilizing SSC for intubated patients and patients with central lines postintervention. Overall, rates of SSC increased in infants younger than 29 weeks of gestation who required intubation and central lines, possibly due to an increase in nursing comfort level (Nation et al., 2021).

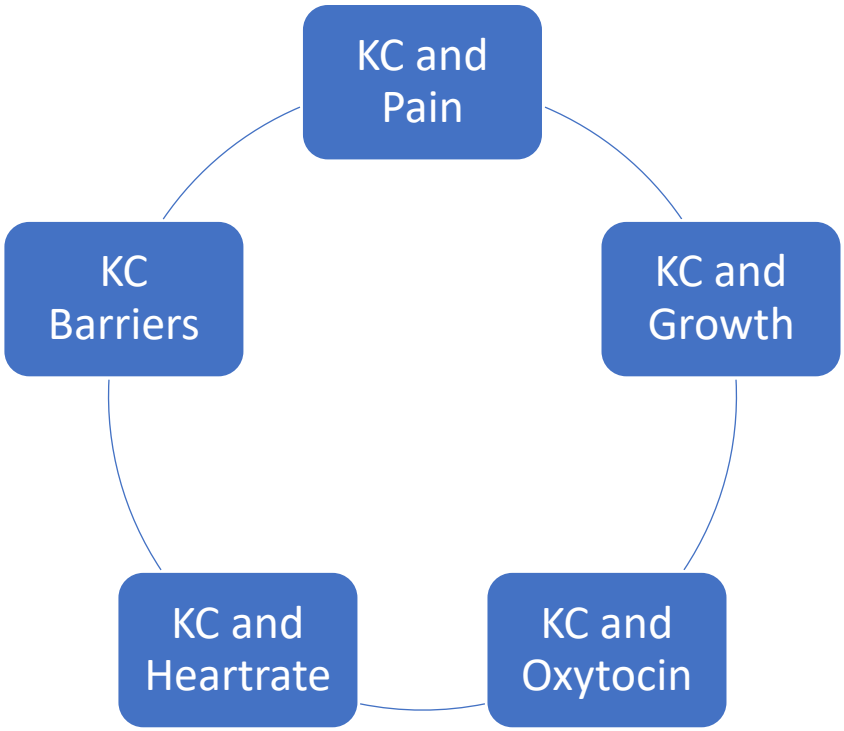
A qualitative study by Coutts et al. (2021) conducted in 11 NICUs in British Columbia examined the barriers to and enablers of KC. Four significant barriers were identified to KC: the physical environment, healthcare provider beliefs, clinical practice variations, and parent presence (Coutts et al., 2021). Fluharty et al. (2021) examined barriers to KC that originated from policies. The study revealed inconsistencies in implementing KC practice due to policies, including variability in infant age and weight criteria, medical equipment in place, duration and frequency, documentation, and ongoing monitoring requirements (Fluharty et al., 2021).

Parent Infant Closeness in the NICU

Increased parental presence and the availability of family rooms in the NICU have shortened infants’ hospital stays (He et al., 2021). A quality improvement project called Close Collaboration with Parents was implemented to examine the benefits of increased parental presence and SSC in the NICU (He et al., 2021). This intervention increased parental presence from 453 to 620 minutes daily. The time spent in SSC before the intervention was 76 minutes per day and 114 minutes after. The study concluded that this project aimed at parenting interventions could promote parent-infant closeness and SSC in the NICU (He et al., 2021). Another study found that skin-to-skin contact promotes physical closeness, calmness, bonding, and breastfeeding (Shattnawi et al., 2022). A summary of the findings is given in Figure 2.

Figure 2

Summary of the Findings of the Review: Effect of KC on Neonatal Outcomes



The review of the evidence revealed a correlation between KC and improved neonatal physiological outcomes. KMC is shown to reduce mortality and morbidity in preterm neonates, prevent hypothermia and infection, improve maternal infant attachment, and increase exclusive breastfeeding (Mohammadi et al., 2021). Studies also showed that KC led to reduced pain, higher weight gain, increased oxytocin, improved cardiorespiratory stress, lowered heart rate, higher oxygen saturation, and increased temperature (Orahood, 2021). The results support using KC in the NICU for preterm infants and address ways to overcome barriers to implementing this care.

Discussion

The literature review evaluated 17 articles related to the physiological benefits of KC in preterm infants in the NICU. In addition to the articles reviewed, policies and procedures for implementing KC were evaluated. The literature review provided evidence to support the use of

KC for preterm infants in the NICU. The review also presented barriers and challenges to implementing this intervention and ways to overcome these.

Overall, using KC in preterm infants less than 34 weeks of gestation has been shown to reduce pain, improve weight gain, increase oxytocin, improve cardiorespiratory stress, lower heart rate, increase oxygen saturation, and increase temperature in the infant. The literature review provided ways to overcome barriers to implementing this intervention in the NICU. These strategies included unit-specific protocols, education, and increased parental presence.

This integrative review supported staff and parents' continued education on KC's benefits. The use of this intervention to improve outcomes for preterm infants depends on the availability of the resources to provide the education and training as well as appropriate staffing to ensure a safe and quality experience. Quality improvement projects such as those mentioned in this review have been shown to increase the use of the intervention.

Overall, the literature supported the purpose of this review. This integrative review aimed to examine the direct relationship between KC and the physiological status of preterm infants under 34 weeks of gestational age. The gaps identified include small sample sizes and a need for more randomization of subjects. In addition to examining KC's positive effects, some articles examined the barriers to implementing KC in the NICU. Another gap in the research is that most articles examined the effects of KMC, and fewer examined the effects of KFC. Further research solely examining the correlation between KC and the outcomes of the neonate would be helpful.

Implications for Practice

The literature review supports KC as an intervention to improve the physiological outcomes of preterm neonates. There is evidence to support the positive outcomes that KC has on neonates' growth, vital signs, stress outcomes, and pain. The purpose of this integrative review was to support the use of KC in the NICU to impact outcomes positively. Implications for practice include improved use of KC for preterm infants in the NICU. The findings in this literature review can potentially impact preterm infant outcomes by leading to improved physiological status while the infants are in the NICU. Among the studies included in this integrative review, all had results indicating that using KC for preterm neonates had more positive than negative implications.

Education is needed for NICU staff and providers as well as for parents. This can be accomplished by utilizing quality improvement projects and interventions. Parental presence

must be increased to increase the use of KC in the NICU. NICUs can provide better opportunities for privacy for parents visiting the bedside, making the environment more comfortable. Many NICUs have options for private rooms or curtains between patients that can help make the environment more conducive to KC. To further improve the environment, education is needed for staff to promote a quiet, low-light atmosphere that is calming to parents and infants.

Further research is needed to examine the use of KC for preterm infants who are critically ill. Determining which preterm infants are good candidates for KC needs to be a joint effort among providers, nurses, and parents. More research needs to be conducted to facilitate optimal decision-making to evaluate the safety and effectiveness of using KC among highly preterm infants because extremely preterm infants typically require extra hands during KC to help with endotracheal tubes, central lines, and other assistive technology. Further research comparing KMC and KFC needs to be conducted. Most research is solely focused on the mother providing this intervention. However, when the mother is unstable or unable to provide SSC, the next best thing is KFC.

Conclusion

In conclusion, there is a positive correlation between KC and improved neonatal physiological outcomes, as evidenced by the examination of 17 journal articles included in this integrative review. Studies showed that KC led to reduced pain, more significant weight gain, increased oxytocin, improved cardiorespiratory stress, lowered heart rate, higher oxygen saturation, and increased temperature. The results support using KC in the NICU for preterm infants and address ways to overcome barriers to implementing this care.

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