IMPROVING PATIENT SATISFACTION WITH QUIETNESS AT NIGHT: AN INTEGRATIVE REVIEW

A Scholarly Project

Submitted to the

Faculty of Liberty University

In partial fulfillment of

The requirements for the degree

Of Doctor of Nursing Practice

By

Victoria Rondez Squier

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Lynchburg, VA

September, 2019

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Scholarly Project Chair Approval:

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Abstract

Despite the efforts to improve the environment of care in hospital settings by noise reducing interventions, building redesigns, and quiet hours, research maintains patients continue to report noise is problematic across all specialties in acute care settings. Patient satisfaction correlates to their perception of quality care and hospitals are economically impacted by their feedback on hospital rating surveys. Stagnant Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey results across the country indicate "Quiet at Night" is in need of attention to be prioritized, as it continues to be the lowest scoring line item on hospital rating surveys since its inception for incentivized reform. A national standard of best practices will improve patient satisfaction and ultimately change the culture of the hospital setting toward a quieter environment for rest and healing. The framework used to develop this review of literature was Melnyk's Leveling of Evidence, the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) and the methodology of Cooper. The multimodal intervention approach was found to be an effective best practice, as it addresses the issues related to poor "Quiet at Night" outcomes comprehensively. However, the intervention approach ought to incorporate pre-intervention preparations, such as a dissemination and implementation plan, to include multidiscipline stakeholder involvement.

Keywords: Quiet at Night; HCAHPS; patient satisfaction; hospital quietness; hospital noise.

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Dedication

This piece is dedicated to my loving husband Timothy; my children Patrick, Jason, and Noah, you three are my inspiration; and to my rock, Mama. This is for you too Papa. Thank you all for your love and support!

Acknowledgement

I would like to first give thanks and glory to my Heavenly Father for I can do all things through Him who strengthens me. A heartfelt thanks to Dr. Sharon Kopis and Dr. Cindy Goodrich for your prayers and kindness while keeping me on track, through my challenges and setbacks. I appreciate so much, my committee Chair, Dr. Goodrich's infectious enthusiasm, as she always picked up my spirit with each encounter. Special thanks to Dr. Roni Rothwell, as our connection has been such a blessing to me. Sincere thanks to all my instructors along the way, thank you Dr. Lynne Sanders, Dr. Dorothy Murphy, and Dr. Tonia Kennedy. For all your help and patience, thank you Ms. Shirley Lee, Mr. John East, and Ms. Faith Sterling. Much, much gratitude to my preceptors Kelly Mather, Laura Sarff, and Chris Tarver, my journey was so greatly enriched by our mentoring relationship. Last but not least I want to say thank you to Dr. Susan Lacy and Dr. Kathryn Wampole for starting off this adventure with a cherished memory of our time together that first week at intensive.

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List of Abbreviations

Centers for Medicare and Medicaid Services (CMS)

Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS)

Integrative Review (IR)

Patient Protection and Affordable Care Act (PPACA)

Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA)

Value-Based Purchasing (VBP)

World Health Organization (WHO)

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IMPROVING PATIENT SATISFACTION WITH QUIETNESS AT NIGHT: AN INTEGRATIVE REVIEW

Since 2010, the Patient Protection and Affordable Care Act (PPACA) prompted the collection of patient satisfaction data regarding the delivery of health care (Carter & Silverman, 2016). This resulted in key quality and safety determinants to inform Centers for Medicare and Medicaid Services (CMS) incentive plans (Carter & Silverman, 2016). By 2015, CMS introduced the Value-Based Purchasing (VBP) plan, giving hospitals the ability to increase reimbursement through a scoring of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey (Carter & Silverman, 2016). The patient experience and outcomes, including quietness, are 60% of the total performance score (Elliot et al., 2016). Nationally, studies indicate sustainable improvements for quietness in the hospital have stagnated (Locke & Pope, 2017). This plateau is reflected by the lack of sustained HCAHPS score increases across the country.

Examining what interventions have worked and what have not, as well as analyzing factors that present as barriers, would help to develop a best practice strategy for sustainable results. Due to the impact of patient satisfaction on hospital ratings and ratings tied to reimbursement incentives, hospitals are able to improve their financial stability and offset the rising costs to deliver safe, effective, quality care. A plan to address the lowest scoring HCAHPS question such as the elusive "Quiet at Night," will result in positive outcomes for both the patients and the organization.

Background

The physiological benefits of noise reduction, such as improved sleep, reduced anxiety, improved circulation, and decreased pain, all support the healing process. Despite the efforts to

improve the environment of care in hospital settings by noise reducing interventions, building redesigns, and quiet hours, research maintains patients continue to report noise is problematic across all specialties in acute care settings. The 2019 data on the Health Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey indicates opportunity for improvement, as the national average of patients who reported the area around their room was "Always" quiet at night is 67% (Medicare.gov, 2019).

How patients perceive their care experience is a driver for improvements, as recognized by the questions included in the HCAHPS survey. The higher reimbursement incentives for Top Box ("always") scores reward the hospitals for those improvements, as patients provide feedback about their care and the hospitals respond. The initial launch of practice changes to improve quietness in the care environment tends to increase survey scores in the beginning; however, ongoing sustainability of those higher ratings trend otherwise, as HCAHPS scores nationally in 2014 reported 70% "Always" quiet at night, just slightly higher than current data (Locke & Pope, 2017).

Decibel readings in a noise reduction program may not be reliable to determine if actual reduction of decibel levels or the reduction of night time care interventions are the cause of patients' perception of noise because patients equate being awakened at night for treatment or therapeutic care as noise (Wilson, Whiteman, Stephens, Swanson-Biearman, & LaBarba, 2017). Alarm fatigue is another phenomenon that makes it difficult to distinguish if medical equipment and technology are noxious noises to patients because for some individuals, rhythmic patterns from alarms and routine hospital sounds, such as carts rolling down hallways, were a source of comfort after one acclimated to his or her environment (Oleksy & Schlesinger, 2018). Thus, both patient perception and actual noise reduction are equally important to the

quality of a patient's care experience. An integrative review and analysis of the literature regarding patient satisfaction with hospital "Quiet at Night" will shed light on the areas that need further investigation and prompt the exploration of strategies to sustain the overall efforts to improve the "Quiet at Night" initiative.

Problem Statement

The problem is maintaining patient satisfaction with quietness at night is a challenge across the country as hospital survey scores reflect little to no change and even declining scores (Xyrichis, Wynne, Mackrill, Rafferty, & Carlyle, 2018). The current literature has identified various sources of noise causing patient dissatisfaction, and the proposed interventions have proven to be effective. However, ongoing compliance to the interventions continue to be a problem. As patients' satisfaction correlates to their perception of quality care and hospitals are economically impacted by their ratings, further exploration to address the issue of low satisfaction with "Quiet at Night" must be prioritized.

Purpose of the Project

The aim of this project is to examine the effective practices to improve patients' satisfaction with the quietness of their hospital environment and to find issues in the area of sustainability of the implemented processes through an Integrative Review (IR).

For the purpose of this IR, "Quiet at Night" refers to the HCAHPS survey question: "How often was the area around your room quiet at night?" (Medicare.gov, 2019). The project investigator anticipated the integrative review would reveal that in addition to multimodal interventions, a behavior and culture change is needed to maintain compliance to a "Quiet at Night" initiative.

Clinical Question

Locke and Pope (2017) reported, despite interventions to improve quietness of the

hospital environment, patients perceive hospitals as noisy environments not conducive to rest and healing. Is there an intervention or interventions that address a patient's perception of quietness coupled with noise reduction techniques that will improve how patients rate their satisfaction with "Quiet at Night"? The studies found in this project show there are a variety of techniques that can be combined.

Literature Review

A preliminary search in the Clinical Key for Nursing database for the literature up to date, this researcher found 1067 articles with regard to hospital noise, quietness, sleep quality, and "Quiet at Night" initiatives. However, in a narrower search of articles current within ten years, This researcher found 367 articles to have commonality and after discovering an overall theme, the project lead decided to further investigate the subject matter. In an initial literature review, this author found articles that included sound measurements in decibels (dB) of various hospital settings, measuring multiple indoor and outdoor locations, and assessments that all areas measured were above the recommended World Health Organization (WHO) sound levels of between 30-40 dB (Hill & LaVela, 2015). The WHO preferred night decibel levels to be between 30-35 dB, that which none of the environments assessed in the studies had met (Hill & LaVela, 2015). Eight studies focused on noise reduction. Noise is subjective, as noise could be manipulated to be physiologically and psychologically beneficial, such as using low-level sounds to mask unwanted noise or using controlled background noise, also known as white noise, such as nature sounds and music, used to create soundscapes (Iyendo, 2016, 2017; Oleksy & Schlesinger, 2018). Though the hospitals studied differed geographically, the similar idea of measuring sound decibels to inform the need to reduce noise did validate that actual sound levels had a negative physiological impact on human subjects and an impact on an individual's

perceptions of the care environment. The noise reduction studies found a variety of noise sources in hospital settings. It is not enough to address the hospital design and to reduce equipment noise, as these are mechanical interventions. The sounds emitted can be measured, reduced and manipulated but a process to mitigate the amount of noise due to the nature of the workflow is also necessary (Rahman, Ali, A., Khan, R., & Tama, 2016; White & Zamordi, 2017; Xyrichis et al., 2018).

Sixteen articles focused on the multi-modal approach to Quiet at Night. Of those studies, nine included designated quiet hours, held either during the day, during the night, or both. Day time quiet hours between 1300 and 1600 proved to be effective in four studies (Applebaum, Calo, & Neville, 2016; Haupt, 2012; Hedges, Hunt, & Ball, 2018; McGough et al., 2018). Quiet hours are typically implemented on critical care units, but two studies were done in acute care, a pediatric medical surgical and an adult medical surgical units, and proved that quiet hours were beneficial to those patient populations as well (Applebaum et al., 2016; Cranmer & Davenport, 2013; Gardner, Collins, Osborne, Henderson, & Eastwood, 2009; Inman, 2015).

Leadership scripting as an intervention was added to the Quiet at Night bundle in the Wilson et al. (2017) study. The scripted leader round was used to gain insight from the patient to offer in-the-moment mediation if needed, not necessarily nor specifically to address the issue of sleep. The intervention was an added attempt to increase patient satisfaction. After differentiating between the themes of sleep quality and patient perception of the environment, the project lead formulated a PICO (problem, intervention, comparison, outcome) question, as recommended by Melnyk and Fineout-Overholt (2011), to further define the search terms. The literature initially reviewed was still too broad, and the project lead recognized that low patient satisfaction with the quietness of the hospital environment was the issue for improvement.

Patient satisfaction and or HCAHPS scores were the measurable data to reflect the effectiveness of the interventions implemented, as opposed to studies related to sleep and sleep quality. Noisiness and quietness perceived by the patient is subjective and the key factor being considered for patient satisfaction.

Each element of a Quiet at Night bundle is important in addressing the issue of quietness in a hospital environment of care, as the studies have indicated. The interventions trialed in these studies proved effective initially, including the combining of the various practices. However, the evidence shows the sustainability of the improvement is problematic with even the longest study, which offered less than a year of data. A more comprehensive literature review and analysis of primary source studies is needed to further investigate the validity of this project.

Methodology

Framework Used

The framework used to develop this IR was Melnyk's Leveling of Evidence, the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) and the methodology of Cooper (1984) and Whittemore and Knafl (2005). Using Melnyk's hierarchy of evidence to critically appraise literature helped to classify and prioritize stronger evidence (Fineout-Overholt, Levin, & Melnyk, 2005). See Appendix A. A study's conceptual framework helps to direct the ideas of an investigator, pulling together all the related aspects of a phenomena of interest culminating into conclusions, possibly new concepts, or new meaning and understanding (Durham, Sykes, Piper, & Stokes, 2015). Medical journals now endorse the PRISMA statement, as it increases the rigor of a study through improved reporting and methodology quality (Durham et al., 2015) . The Cooper (1984) framework is similar to a systematic review or meta-analysis, which synthesis quantitative data (Polit & Beck, 2010).

Combining mixed-methods and qualitative research, as recommended by Whittemore and Knafl (2005), also increases a rigor and reduces bias in a systematic review.

As an example, Doolen (2017), distinguishing meta-analysis, systematic reviews, and integrative reviews from one another, highlighted that it is not enough to include both qualitative and quantitative research studies but for the strength of validity a specific replicable process must be used in its approach. Hopia, Latvala, and Lilimatainen (2016) discussed five stages of an integrative review based on Cooper's theoretical framework: (a) problem identification, (b) literature search, (c) data evaluation, (d) data analysis, (e) presentation (p. 663). For this review, the research followed the stages, assessed the articles for strength through Melnyk's hierarchy of evidence, and sorted the articles through the PRISMA Flow Diagram (Moher, Liberati, Tetzlaff, & Altman, 2009). The PRISMA flow diagram first identified records through a search in databases and other sources. Next, those records were screened for duplicates and eligibility was determined by exclusion. Then, full text articles were assessed for eligibility and reasons were given for those exclusions. The remaining studies were included in the integrative review. See Appendix B.

Tools Used

The key objective of the PRISMA tool is to reduce bias using a defined technique to report evidence for systematic reviews (Moher et al., 2009). The PRISMA flow diagram provides a visual algorithm to follow when selecting evidence (see Appendix B). Melnyk's hierarchy of evidence tool assesses the literature for strength and rigor, ranging from low level expert opinion to the highest level of research using randomization (see Appendix A).

The articles returned in this project were supported by higher levels of evidence, but the primary studies were primarily descriptive studies and quasi-experimental studies measuring

quality improvements. Both tools do not require permission, and both are reliable in measuring its definitions. Additionally, the project lead completed the Collaborative institutional Training Initiative (CITI) Training regarding research and human subjects. See Appendix C.

Search Strategy

A comprehensive search was completed in the databases of the Cochrane Library, Cumulative Index to Nursing and Allied Health Literature (CINAHL), EBSCO HOST, Medline (ProQuest), PubMed, and Scopus using keywords Quiet at Night; HCAHPS; patient satisfaction; hospital quietness; hospital noise. The search was limited to studies between 2013-2019, written and or translated into English. Articles prior to 2013, were excluded, as the implementation of Value Based Purchasing (VBP) through the Centers for Medicare and Medicaid Services (CMS) was not yet enacted.

Inclusion and Exclusion Criteria

Only primary studies were the focus for inclusion to decrease bias (Polit & Beck, 2010). The secondary studies found were only used to inform primary studies, such as to provide additional citations for review and to support agreement or contradiction of the primary sources. Subjects from inpatient hospital settings were included. Excluded were studies with subjects from outpatient settings, Emergency Departments, Labor and Delivery departments, and Operating Room departments. Additionally, neonates, infants, and pediatric specialties were excluded, as these populations are unable to provide a subjective response to the phenomena of interest. See Table 1.

Study Selection

The studies selected came from the online database search returns. Then, the studies were prioritized according to highest level of evidence using Melnyk's hierarchy of evidence

criteria (Melnyk & Fineout-Overholt, 2011). The PRISMA tool was applied to critique those studies. A variety of qualitative, quantitative, and mixed-method peer reviewed studies were included along with relevant supporting literature.

A total of 425 studies were identified through the database search: Cochrane Library (58 records), Cumulative Index to Nursing and Allied Health Literature (CINAHL) (57 records), EBSCO HOST (90 records), Medline (ProQuest) (15 records), PubMed (122 records), and Scopus (83 records) and no other sources were assessed for screening. After duplicates were removed, 295 were excluded for not meeting inclusion criteria. Fifty records were screened and 10 were excluded due to exclusion criteria. Six articles were not primary sources, three studies conducted in the excluded specialty units, and one study outside the timeline parameters.

Forty full text articles were identified as eligible for inclusion and 31 records were excluded. Of the eligible excluded records, two were related to sleep quality (Hopper, Fried, & Pisanai, 2015; Waye, Elmenhorst, Croy, & Pedersen, 2013), three mentioned HCAHPS and the "Quiet at Night" question but were studies meant to inform the use of patient satisfaction surveys regarding reimbursement (Carter & Silverman, 2016; Elliott et al., 2015, 2016). Four studies explored the use of sounds to create a positive soundscape such as music and nature sounds (Iyendo, 2016, 2017; Oleksy & Schlesinger, 2018) and the study of sound and light (Voigt et al., 2017), but did not validate its application toward patient satisfaction . Nine editorials focused on noise in the hospital and the healthcare setting. Though they were peer reviewed as expert opinions, the articles lacked rigor, thus, excluded. Five studies were experimental in measuring the impact of noise decibels on health and the healthcare setting; however, the studies did not specifically address patient perception and satisfaction regarding the noise levels (Hill & LaVela, 2015; Knauert et al., 2016; Rahman et al., 2016; Swinburn, Hammer, & Neitzel, 2015; White &

Zomorodi, 2017). Two excluded articles addressed patients' perceptions and patients' perspectives and discussed HCAHPS (Devlin, Andrade, & Carvalho, 2016; Stein, Day, Karia, Hutzler, & Bosco, 2015) but did not specifically study an intervention to address "Quiet at Night." Another excluded editorial discussed the role of patient perception on patient satisfaction and how intentional conversation with regard to night disturbances helped to improve patient satisfaction (Kadom & Nagy, 2014) but no further exploration to validate the practice was conducted. Three primary source studies that were excluded were found to lend insight for a quiet environment or a noise reduction program by recommending the aid of a librarian (Deberg & Egeland, 2014) and a stress reduction program to enhance a quiet environment (Mousley, 2015) but did not explore the patient response. Three records discussed the benefits of a quiet time intervention, a reported quiet time as part of a hospital-wide "Quiet at Night" intervention (McKinney, 2013) and two studies on the impact of quiet time on nurses performance (Feldman & Sobrino-Bonilla, 2014; Riemer et al., 2015). However, all three studies did not measure patient satisfaction.

Only nine articles were appropriate to include in response to the clinical question and each record was critiqued for the highest level of peer reviewed rigor. The project lead was seeking an intervention that addresses both patients' perception and patients' satisfaction with "Quiet at Night" and found that the studies selected offered an intervention measured by a patient satisfaction questionnaire pre- and post-intervention. See Table 2 and Table 3 for the compiled results summary.

Results

Selected Studies

After the preliminary literature review, a more rigorous approach to narrow the literature search results for the topic of interest was applied through the use of the PRISMA flowchart tool (Moher et al., 2009). The final records returned, that met both applicable criteria for final inclusion were critiqued with a strength analysis using Melnyk's hierarchy of evidence (Melnyk & Fineout-Overholt, 2011). The articles selected were primary studies formally exploring interventions to address patient satisfaction with Quiet at Night.

Study Characteristics

Four studies were Level III, as each project was a quasi-experimental design without randomization. One project was Level IV, a well-designed cohort study. Also, four articles were Level VI, descriptive or qualitative studies. A critical analysis of each article was necessary to determine the trustworthiness of each piece in answering the clinical question (Melnyk & Fineout-Overholt, 2011).

Results of Individual Studies

Exploring the effect of quiet hour/s time blocks on patient perception were the primary focus of six studies. Each study incorporated a quiet period supported by additional techniques to reduce noise and enhance the quietness of the environment. Applebaum et al. (2016), Hedges et al. (2018), McGough et al. (2018), and Murphy, Bernardo, and Dalton (2013) combined their quiet time intervention with scripting, a formal introduction of the intervention, an overhead announcement, and standard message signage. Also, the same authors addressed the patient care environment with regard to lighting, alarm volumes, and doors.

Hinkulow (2014) specifically designed her study to analyze the quieted environment in a

subdued state of activity, with dimmed lighting for a blocked period of time. Haupt (2012) highlighted the role of the staff in promoting the quiet hours, as their buy in contributed to the efforts to improve patient satisfaction.

The authors of two studies, Hedges et al. (2018) and Murphy et al. (2013), took a multi-modal approach. Their project intervention implemented the blocked quiet hour/s with all the noise reduction techniques, scripting, signage, along with building design elements, equipment maintenance and they further included an intentional patient engagement strategy, offering sleep enhancing implements such as eye masks, ear plugs, pharmacological sleep aids, and light snacks (Hedges et al.,2018; Murphy et al., 2013). But, more important to the success of both multi-modal interventions, focused on incorporating the quiet periods, was the multi-discipline involvement, through a hospital-wide formal employee education plan (Hedges et al.,2018; Murphy et al., 2013). All the projects measured success by measuring patients' satisfaction with the quietness of their environment.

The Locke and Pope (2017) project was unique in design to study one element of noise reduction, a specialized curtain for privacy and it too measured patient satisfaction. Unique to the Wilson et al.(2017) study was a combination of patient involvement, employee involvement, and leadership involvement. When the leaders of the unit rounded on the patients, they had intentional conversations with the patients to gain feedback on the efforts made to address the care environment, which led to more positive perceptions and improved patient satisfaction (Wilson et al., 2017).

Summary of Evidence

All nine studies, that met inclusion criteria, were able to achieve improved patient satisfaction results. One study focused on a single intervention not combined with additional

interventions. The eight remaining studies implemented an intervention with added support measures to promote the desired outcome. Two of those studies focused on an intentional multimodal approach.

Locke and Pope (2017) focused on a single acoustic aspect of noise reduction by examining the use of the Hush Curtain®. This study resulted in a one-point increase from baseline to the relevant HCAHP score. Wilson et al. (2017) intentionally applied a bundled intervention, which included the involvement of leadership to help facilitate resolution of issues that are brought up during leader rounds. The data report indicated that 70% of the 80 subjects who filled out a questionnaire responded positively to the overall intervention (Wilson et al., 2017).

Wilson et al. (2017) implemented a multimodal approach, which included a formalized employee education plan on the bundled intervention. Furthermore, Murphy, Bernardo, & Dalton (2013) yielded improved "Quiet at Night" HCAHPS scores by 1% and the interventions of Hedges et al. (2018) improved "Quiet at Night" HCAHPS scores by 38% on one unit and 17% on a second unit. Both studies highlighted education is a key piece of the combination intervention program. Inman's (2015) intervention also detailed a hospital-wide employee education plan for new employee orientation.

Hedges et al. (2018) specifically examined the aspect of adding a multidiscipline team of stakeholders to their study's multimodal intervention and noted the unique component. The intervention improved the reviewed baseline data by 7%-12%. Applebaum et al. (2016), Hedges et al. (2018), Hinkulow (2014), McGough et al. (2018), and Murphy et al. (2013) promoted the importance of how interventions ought to be nurse-led and to designate staff champions. These five studies had scripting included as part of the intervention bundles to mitigate and improve

patient perceptions of quietness.

Six studies were primarily focused on examining the effects of blocked quiet hours on patient perception. The results proved to enhance positive perception outcomes. Four studies (Applebaum et al., 2016; Haupt, 2012; Hedges et al., 2018; Murphy et al., 2013) implemented blocked quiet times during the day and two studies (Hedges et al., 2018; McGough et al., 2018) applied two blocked periods of quiet hours. The blocked quiet intervals were incorporated with a combination of the various supporting interventions.

Discussion

Synthesis of Results

An integrative review is appropriate to evaluate mixed-method studies, as it is able to include a broader range of evidence that more restrictive systematic reviews and defined meta-analysis of research excludes (Whittemore & Knafl, 2005). The compilation of evidence serves to prompt further investigation and to evoke interest in adding to the body of knowledge. This project comprehensively investigated an aspect of healthcare that is finally gaining more attention, as more evidence emerges.

Patients' satisfaction with the quietness of their environment has taken a backseat to more pressing healthcare matters such as infection control, medication safety, and hospital-acquired injuries to name a few. Being that healthcare is in the business of saving lives, it makes sense to prioritize the reduction of harm. Since the 1999, Institute of Medicine report, *To Err is Human: Building a Safer Health System*, consumer awareness of patient care delivery systems have driven the improvements made to the healthcare industry, along with governmental agencies such as CMS and the 2010, Patient Protection and Affordable Care Act (PPACA), which has greatly improved the standards of care across the U.S.

Perhaps the years of survey results for Quiet at Night are now gaining recognition, due to the HCAHPS survey results not showing steady sustainable gains, like the other survey line items addressing patient safety. This project lead discovered through an integrative literature review, that attempts have been made to improve this issue of concern but further exploration to validate and support recommended best practices have yet to emerge.

Nursing Implications

The changes in practice and workflow must be nurse led, as nurses at the bedside have the most control over the immediate patient care areas. Engaged frontline staff are more suited to influence a hospital-wide initiative and culture change. When partnered with leadership, the likelihood of ongoing practice standards are optimized, as leadership influences infrastructure and system processes. The ebb and flow of daily census, patient acuity, changes in personnel at all levels, and unit traffic will have a lesser impact when processes for a standard are in place and monitored over time.

A significant component of a standard process must include education and a plan for ongoing education for a variety of reasons. First of all, introduction of a hospital-wide initiative or action plan, will need training, which should include the rationale behind it. Stakeholders include all those who provide the services. They need to know the "why," the creation of a healing environment. The constructs of what defines that environment ought to be evidence based, such as the successful trialed practices found in this IR. Secondly, an ongoing plan is needed to educate the patient population and their families, the community, as they too are stakeholders. Lastly, just like a new patient orienting to the unit routines, new employees must be formally introduced and educated about the Quiet at Night initiative.

Quiet at Night initiatives may include a combinations of interventions recommended in

this IR. However, the ideal practice initiative should bundle the key elements: blocked quiet times, scripting and leader rounds, hospital wide involvement, and hard-wired orienting and ongoing employee education. This begins with a plan for dissemination, which includes a team or committee to execute the plan, a means to measure long term outcomes and the facility decision makers to facilitate sustainability.

Limitations

Potential investigator bias may still exist despite measures taken to reduce the risk. Excluded, untranslated evidence and non-full text articles are also a limitation, as the articles were left unevaluated. Though the number of studies are sufficient, adding higher level, current evidence would increase the strength of this study.

Conclusion

The interventions presented in the studies reviewed proved to be effective at improving the environment of the hospitalized acute care patient. How an individual perceives noisiness and quietness is subjective. Thus, relying solely on mechanical interventions without considering the perspective and perceptions of the patient will fall short of the goal to improve patient satisfaction, as patient satisfaction is also subjective.

The multimodal intervention approach is found to be an effective best practice, as it addresses the issues related to poor “Quiet at Night” outcomes comprehensively. However, the intervention approach ought to incorporate pre-intervention preparations, such as a dissemination and implementation plan, to include multidiscipline stakeholder involvement. Moreover, ongoing support processes, such as a hospital-wide education plan, which includes educating the new employees, a leader rounding follow up, and designated champions will bolster

effectiveness. An effective nurse-led, “Quiet at Night” initiative will ideally combine the various interventions and initiate the ultimate culture change needed for sustainability. Thus, future research or an evidence-based practice project should include a plan to measure outcomes over a longer period of time and its effects on the dynamics of the practice culture.

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TABLES

Table 1.

Inclusion and Exclusion Criteria

Inclusion	Exclusion
Publications from 2013-2019	Publications prior to 2013
Adult patients > 18 yrs.	Patients < 18 yrs.
Peer-reviewed, primary source	Grey literature (i.e. unpublished articles dissertations, policy documents)
English language	Publications written in foreign language (untranslated to English language)
Full-text articles	Abstract only articles
Inpatient acute care setting	Outpatient, Emergency/Urgent Care, Labor and Delivery, OR, Peri-Op

Table 2.

Evidence for Improving Quietness and Patient Satisfaction

Focus of Article, Author/year	Level of Evidence/Source	Background/Intervention	Conclusion/Practice Implications/Recommendations
To examine if a quiet hour would help to reduce noise and improve the perception of quietness in an acute care hospital setting (Applebaum, Calo, & Neville, 2016)	III/Primary	• Nursing staff on a 30-bed medical-surgical unit were formally presented a sound reduction intervention • 1hr quiet-time between 3 PM-4 PM Monday-Friday • Quasi-experimental, without randomization	• Perceived quiet time reduced the overall noise levels in the environment of care • Awareness to the issue and intervention also contributed to noise reduction, including subject bias and methodology limitations (inconsistent pre and post intervention subjects) • Nursing staff leading the intervention with nurse leader support is key to its success
Reports how adding a quiet hour to a healthcare system's existing noise reduction program improved patient satisfaction (Haupt, 2012)	VI/Primary	• A 30-bed medical surgical unit with an existing noise reduction program added a quiet hour • Patient education upon admission and ongoing throughout stay, 1hr quiet-time daily from 1300-1400 • A descriptive study	• The intervention proved to be effective in improving patients' satisfaction with unit noise levels • Data collection lacked rigor, however, a pre and post questionnaire was used • Extending the hour and or additional evening hour was recommended

The aim was to improve HCAHPS scores for quietness in the hospital with a multidisciplinary nurse led quiet hours routine (Hedges, Hunt, & Ball, 2018)	IV/Primary	• 2 Medsurg units totaling 57 beds, eligible for HCAHPS surveys with poor "quiet at night" scores • Intentional inclusion of multidiscipline stakeholders using Lean A3 methodology • Quiet Time (QT) hours implemented between 2-4 PM and again at 5 AM • A cohort study	• Significant improvement in the first 3 months on both units • Decibel readings and sleep quality surveys were inconsistent with HCAHPS scores, observations discovered successful practices to disseminate • Nurse driven with multiple stakeholder QT and a comprehensive noise reduction program focused on changing expectations for quiet improves patient perception
The aim of the study is to use a quiet time bundle to improve patient satisfaction and patient and nurse perception of noise in the acute care hospital setting (McGough et al., 2018)	III/Primary	• 4 progressive care units in a community hospital applied combined interventions to decrease noise • The intervention included 2 blocks of time designated as Quiet Time, 1400-1500 and 0200-0300 • Noise levels were measured in dB • Quasi-experimental, without randomization	• Pre and post survey data resulted in increased satisfaction • Both patients and nurses reported that noise had a negative impact on the units • Despite a small decrease in noise dB, the interventions proved to improve the perception of quietness of the environment[
To examine the impact of the Hospital's Ultimate Silence or Healing (HUSH) program, an acoustic intervention, on	VI/Primary	• A two-phase descriptive study using HCAHPS scores and nurse interviews to measure outcomes of the HUSH program	• The intervention's intent is to change the nursing culture in the acute care setting

HCAHPS scores (Hinkulow, 2014)		• HUSH program includes a quiet time (unspecified in the study) • Piloted on an oncology unit and extended to a hospital-wide implementation	• The study is foundational to further studies on the effects of a quiet restful environment on mental health outcomes of patients and nurses
To determine if quality improvements focusing on perceptions of noise can affects patients' satisfaction related to hospital quietness (Inman, 2015)	VI/Primary	• Patients surveyed on their perspective of perceived noise sources led to a patient-centered approach • Various practice changes were implemented based on patient survey responses • A descriptive study	• Practice changes such as scripting and individualized approaches coupled with staff involvement and education to increase awareness proved effective • Timeliness in addressing reported barriers to practice changes impacted sustainability • Education upon new employee orientation and intermittent ongoing survey reassessments are recommended
To explore the use of a Hush Curtain to reduce noise and examine its impact on the hospitalized patient's environment and ability to rest (Locke & Pope, 2017)	III/Primary	• A comparison of rooms on a medsurg unit with the Hush Curtain versus rooms with the standard privacy curtain • Patients surveyed using a 12-item assessment tool and pre and post intervention HCAHPS scores were compared • Quasi-experimental, without randomization	• Curtains did not align with infection control standards and participation in the assessment was problematic • A one point from baseline increase in quietness around the room at night was reported and declined an average of four points from baseline after curtains were removed

			• Inconsistent result findings were impacted by multiple limitations but found that patient noise sensitivity was a factor for further exploration
To study the effects of multiple small practice changes to reduce noise and staff involvement on patient satisfaction with "Quiet at Night" (Murphy, Bernardo, & Dalton, 2013)	VI/Primary	• Strategies include noise reduction literature review, designated quiet hours, hospital wide staff involvement, sound assessment, establishing equipment standards, and education • Initial application of intervention on a pilot unit and three survey periods before hospital wide implementation • A qualitative study	• A multimodal approach resulted in a cumulative effect • Sustainability was a challenge • Nurses play a crucial role in creating the optimal environment of care
The study examines a multifaceted noise reduction program to decrease noise at night and improve patient satisfaction (Wilson et al., 2017)	III/Primary	• Iowa Model of EBP used to guide the project to implement a multimodal intervention • 2 Pilot units on medical-surgical patients • Intervention includes patient preference poster, nighttime cart (filled with light snacks and sleep hygiene supplies), purposeful leader rounds, staff education, noise committee rounds, sound level measuring	• Difficult to distinguish if perception of noise is related to noise levels or interrupted sleep • Staffing levels affect staff's ability to complete interventions as planned • Sustainability is problematic

		• Quasi-experimental, without randomization	

Table 3.

Intervention Matrix

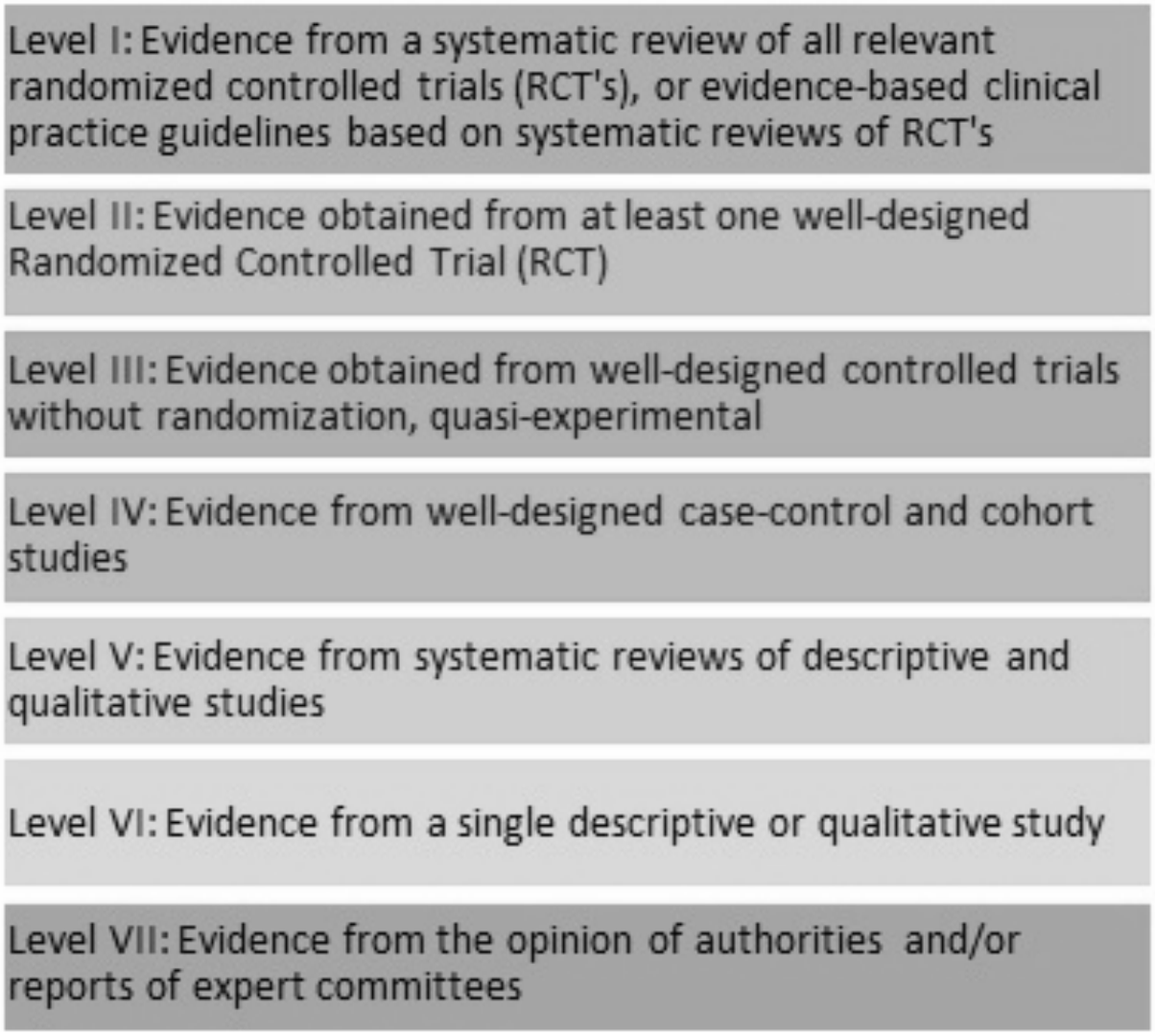
Study	Quiet Hour Blocks	Leader Rounding	Sleep Hygiene Implements, Light Snack, Sleep Aid (pharm)	Design Elements, Maintain Equipment	Hush® Curtain, Acoustics	Lighting, Alarm Volume, Doors	Overhead Intro Message, Signage	Scripted Intro	Employee Education, Staff involvement
(Applebaum, Calo, & Neville, (2016)	**X**					X	X	X	
(Haupt, 2012)	**X**					X	X		X
(Hedges, Hunt, & Ball, 2018)	**X**		X	X		X	X	X	**X**
(McGough et al., 2018)	**X**		X			X	X	X	X
(Hinkulow, 2014)	**X**					**X**			
(Inman, 2015)						X	X	X	
(Locke & Pope, 2017)					**X**				
(Murphy, Bernardo, & Dalton, 2013)	**X**		X	X		X	X	X	**X**

(Wilson et al., 2017)		**X**	**X**						**X**

*Bold-main study focus

Appendix A

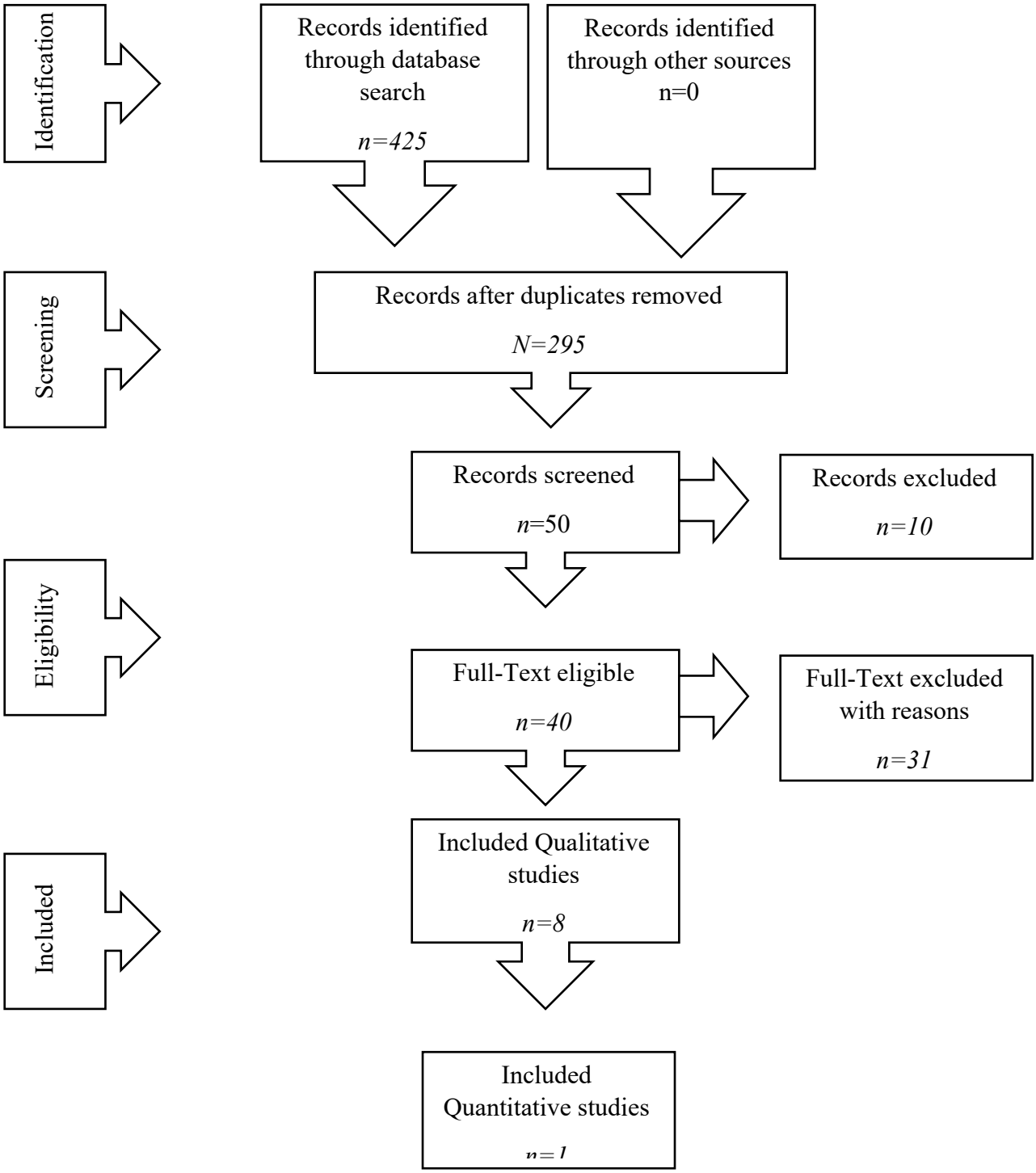
Melnyk's Hierarchy of Evidence

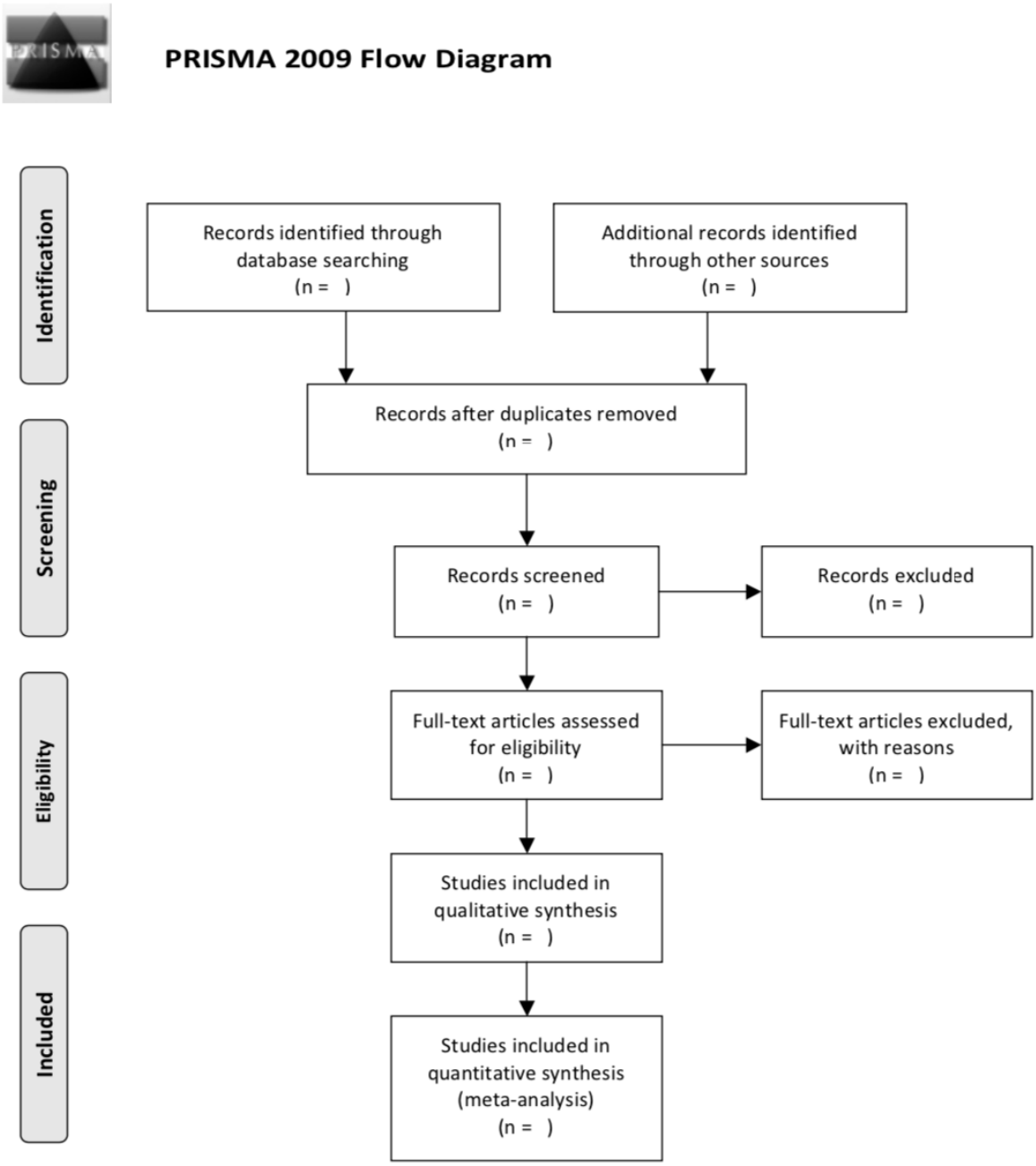


(Melnyk & Fineout-Overholt, 2011)

Appendix B

Project Leader's PRISMA Flow Diagram





From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit www.prisma-statement.org.

Appendix C

CITI Training Certificate

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)

COMPLETION REPORT - PART 1 OF 2
COURSEWORK REQUIREMENTS*

* NOTE: Scores on this Requirements Report reflect quiz completions at the time all requirements for the course were met. See list below for details. See separate Transcript Report for more recent quiz scores, including those on optional (supplemental) course elements.

- **Name:** Victoria Rondez (ID: 5897938)
- **Institution Affiliation:** Liberty University (ID: 2446)
- **Institution Email:** vrondez@liberty.edu
- **Institution Unit:** Nursing

- **Curriculum Group:** Biomedical Research - Basic/Refresher
- **Course Learner Group:** Biomedical & Health Science Researchers
- **Stage:** Stage 1 - Basic Course
- **Description:** Choose this group to satisfy CITI training requirements for Investigators and staff involved primarily in biomedical research with human subjects.

- **Record ID:** 21118704
- **Completion Date:** 13-Oct-2016
- **Expiration Date:** 13-Oct-2019
- **Minimum Passing:** 80
- **Reported Score*:** 100

REQUIRED AND ELECTIVE MODULES ONLY	DATE COMPLETED	SCORE
Belmont Report and CITI Course Introduction (ID: 1127)	10-Oct-2016	3/3 (100%)
History and Ethics of Human Subjects Research (ID: 498)	10-Oct-2016	7/7 (100%)
Basic Institutional Review Board (IRB) Regulations and Review Process (ID: 2)	11-Oct-2016	5/5 (100%)
Informed Consent (ID: 3)	12-Oct-2016	5/5 (100%)
Social and Behavioral Research (SBR) for Biomedical Researchers (ID: 4)	12-Oct-2016	4/4 (100%)
Records-Based Research (ID: 5)	12-Oct-2016	3/3 (100%)
Genetic Research in Human Populations (ID: 6)	13-Oct-2016	5/5 (100%)
Populations in Research Requiring Additional Considerations and/or Protections (ID: 16680)	13-Oct-2016	5/5 (100%)
FDA-Regulated Research (ID: 12)	13-Oct-2016	5/5 (100%)
Research and HIPAA Privacy Protections (ID: 14)	13-Oct-2016	5/5 (100%)
Vulnerable Subjects - Research Involving Workers/Employees (ID: 483)	13-Oct-2016	4/4 (100%)
Recognizing and Reporting Unanticipated Problems Involving Risks to Subjects or Others in Biomedical Research (ID: 14777)	13-Oct-2016	5/5 (100%)
Conflicts of Interest in Research Involving Human Subjects (ID: 488)	13-Oct-2016	5/5 (100%)
Liberty University (ID: 15111)	13-Oct-2016	No Quiz

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

Verify at: www.citiprogram.org/verify/?kea559075-67af-4452-bb8a-bdabdc6c47b1-21118704

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